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CAUSE OF THE DETERIORATION OF COMMERCIAL CHRYSAROBIN.*

BY CHARLES RICE, PH.D., OF NEW YORK.

> "Dermatologists have lately complained that the chrysarobin at present dispensed or sold does not appear to have the effect or strength which it had some five or six years ago. One prominent authority informs the Committee that he is compelled to treble the quantity to produce the same effect as has been produced formerly. To what cause can this deterioration in effect be ascribed?"

A FULL reply to this question, which was referred to the writer by the Association, cannot be submitted at the present time, chiefly because authentic specimens of the crude material, Goa powder, promised from South America, have not yet come to hand. Nevertheless a partial answer may be made, based upon the reported experience of various observers.

In the first place, there is no doubt whatever that dermatologists have lost confidence in the quality of the chrysarobin at present supplied, which seems to be very much weaker in its action than that furnished in former years, or even than Goa powder itself. Numerous authorities have put themselves on record, regarding this matter, in the recent medical literature.

It is well known that Goa powder (araroba, pó de Bahia) and the proximate principle chrysarobin (often misnamed chrysophanic acid) prepared from it have been used for the purpose of setting up an artificial specific irritation or inflammation of the skin, which, when produced on surfaces affected with herpes circinatus, psoriasis, intertrigo, and certain other forms of skin disease, often results in subduing and removing the latter, though it is sometimes accompanied by disagreeable consequences.

An answer to the question why the chrysarobin at present supplied does not possess the activity of that of former years involves the study of several subordinate points, particularly the following:

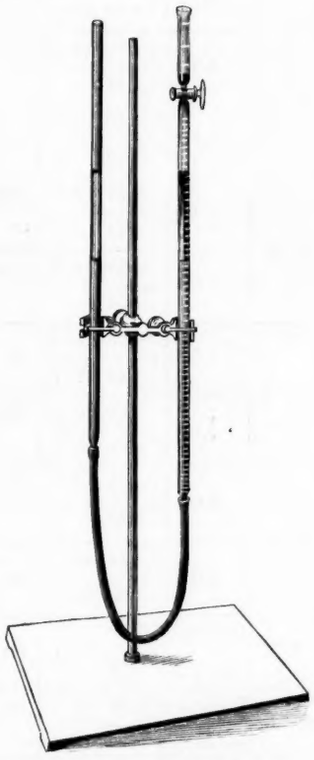
1. In what does the chrysarobin at present supplied differ from that of former years?
2. Is the chrysarobin of the present market prepared by the same method as formerly?
3. Is the Goa powder of the present market of the same character as that supplied some years ago?
4. Is there not some substance in Goa powder which is more active than the chrysarobin extracted from it, or which at least intensifies its action?

The first point can only be decided by actually comparing samples of old and of fresh chrysarobin. If a specimen of the former (about ten years old) should be in the possession of a member of the Association, he would greatly oblige the writer by sending it to him. At present no such sample is available.

Regarding the second point, it is known that chrysarobin is extracted from Goa powder by exhausting it with boiling benzol, and, after concentration of the solution, allowing it to crystallize from the latter. This is, at least, the general outline of the process, the details employed by the few manufacturers engaged in preparing it not being known.

The third point should be studied in connection with authentic samples of Goa powder obtained from sources outside of the influence of trade interests. Steps have been taken to procure these, but up to the present no specimens have been received. (The commercial Goa powder is not suitable for such investigations, as it is not above suspicion.) Hence no attempt has been made to follow up this question.

Finally, regarding the last mentioned point, we are in a position to give a partial reply, more in the form of a surmise, however, than as a definite answer. It has been a standing complaint with manufacturers having to handle Goa powder, that whenever this substance has to be milled or bolted, or was otherwise diffused in dust, the workmen coming in contact with it were invariably affected with a more or less severe inflammation of the eyes, lasting for several days. On the other hand, it has been noticed during late years that the dust of chrysophanic acid, diffused in the same way, produces only a comparatively feeble inflammation. It was, therefore, natural to suspect that Goa powder might contain some substance still more active than chrysarobin, and this is rendered highly probable by a recent report made by the well-known house of Gehe & Co., of Dresden, to the effect that the mother-liquid left after the crystallization of chrysarobin, when evaporated, left behind an amorphous substance which was experimented with by Dr. Lesser, of Leipzig, and which appears to contain a principle considerably more active than chrysarobin.



Allen's apparatus for estimation of nitrites.

The short time which has elapsed since the writer has received this information, has made it impossible to follow the subject further in time to report at this meeting of the Association. Should there be an opportunity of continuing the investigation, upon the arrival of the expected samples, the results will be communicated subsequently.

* Read at the meeting of the N. Y. State Pharm. Assoc., in reply to query No. 40.

THE PREPARATION OF SPIRIT OF NITROUS ETHER FROM COMMERCIAL "CONCENTRATED NITROUS ETHER."*

BY WILLIAM SIMONSON, OF SPRINGFIELD, OHIO.

> "Is it advisable to make Sp. Ætheris Nitrosi from the 'Concentrated Nitrous Ether' of the market?"

AT the last revision of the U. S. P. the formula for making this preparation was radically changed. In the older process all the volatile condensable products of the distillation were retained in the finished article; in the newer one the principal product (ethyl nitrite) is partly freed from other products by washing with cold water, and is then dissolved in nineteen parts of alcohol. Acting on the plan of this formula, the manufacturing chemist carries the operation to the preparation of the washed ether, and places the product on the market under the name "Concentrated Nitrous Ether."

For commercial reasons this article has come into extensive use, and inquiry into the strength of the brands most largely sold is *proper*. The object of the present investigation is the percentage of ethyl nitrite, or, rather, of total nitrites. Of the many methods and reactions employed for this purpose, the most trustworthy are those involving the generation and measurement of nitric oxide. Two such assay processes are in use, Eyckman's and Allen's. The latter of these was chosen, as the results obtained by its use are higher and more constant, and because, owing to its easy and rapid execution, it is the one that will come into use by those pharmacists who employ any process whatever.

The form of nitrometer best suited to this use is a straight tube graduated in one-tenth C.c. for 10 C.c. above and 50 C.c. below the stop-cock, which is placed about one-fifth the length of the tube from its upper end. It is connected by a rubber tube of equal length to a reservoir having the same length and capacity as the nitrometer; both being mounted so that either may be raised or lowered quickly and easily. In making estimations, the opening in the stop-cock and space below are filled with mercury by elevating the reservoir. The opening having been closed, the reservoir is lowered a few inches and the spirit measured in above the stop-cock. Having been allowed to pass into the lower limb, the spirit adhering to the walls of the tube is washed in by 2 C.c. of water in several portions, 5 C.c. of a saturated solution of potassium iodide (free from carbonate) is next passed in, followed by an equal volume of dilute sulphuric acid. As the reaction proceeds, the reservoir may be lowered or the nitrometer raised so as to keep the mercury near the same level in both; when nearly finished, the nitrometer is detached, vigorously shaken, and replaced in its support. A repetition of this treatment is necessary, and is almost always sufficient. The liquid beneath the gas has sp. gr. about 1.17, and is counterbalanced by a solution of sodium chloride of the same sp. gr. The mercury surface in each tube having been kept at the same level, the gas will come to a constant volume in about twenty minutes, and is then read off. The percentage of ethyl ni-

* Read at the meeting of the Ohio Pharm. Assoc. in answer to query No. 31, and awarded the first prize by the Committee on Prize Essays.

trite is obtained by the following equation, which allows corrections for temperature and pressure:

$$\frac{\text{No. C.c. gas} \times .3185 \times \text{observed pressure in MM.}}{\text{No. C.c. spirit} \times \text{sp. gr. of spirit} \times 790} = \frac{\text{(Barometer.)}}{= \% \ C_2H_5NO}$$

At other temperatures the following values replace .3185:

10°C.=. 241	14°C.=.3196	18°C.=.3152	22°C.=.3109
11°C.=.3230	15°C.=.3185	19°C.=.3141	23°C.=.3099
12°C.=.3218	16°C.=.3174	20°C.=.3130	24°C.=.3088
13°C.=.3207	17°C.=.3163	21°C.=.3120	25°C.=.3078

In estimating the quantity of ethyl nitrite in commercial nitrous ether, the first step is to make an accurate alcoholic dilution. Two methods may be used, the second being as accurate and more convenient and the one employed in making the tabulated assays. A 50-Gm. sp. gr. flask is nearly filled with alcohol, weighed, about 1.5 C.c. of the ether, cooled to near 0° C., added, its weight found by again weighing; then bringing the mixture to 15° C., adding alcohol until the graduated mark is reached, and again weighing. The last weighing gives the sp. gr. This dilution must be used at 15° C., or very near it, or the variation due to expansion or contraction will overcome the error of experiment. By the second method the sp. gr. flask is replaced by a narrow-necked volumetric flask holding 50 C.c. The dilution is made in the same manner, the first adjustment being made at the temperature at which the dilution is to be used. This avoids the error due to expansion or contraction, and does not require that the sp. gr. be known. In making assays the volume of spirit used is best measured by a narrow 5 C.c. pipette, graduated in $\frac{1}{10}$ C.c., the tip pressing into the opening of the stop-cock, and the mercury level lowered as fast as the spirit enters. With care, duplicate assays may be made to accord within less than one-half of one per cent, and seldom approaching one per cent, of the contained ether. The assay is then finished in the manner described. The volume of gas having been observed, its equivalent in the dry state at 0° C. and 760 Mm. pressure is found by the following equation:

$$\frac{\text{No. C.c.} \times 273 \times (P - V)}{(273 + T) \times 760} = \text{volume,}$$

P = observed pressure.
T = temperature.
V = vapor tension at operating temperature, assumed to be that of water.

A further correction for solubility of the gas must be made. As quoted from the original paper of the author of the process by several American pharmaceutical journals, 1.5 C.c. is dissolved by the mixed liquids in the nitrometer tube. As a strong brine was employed instead of mercury, the volume of liquid that absorbed gas was probably variable and is not definitely stated, but is left to inference, and is supposed to be about 15 C.c. In the assays made for this paper, the volume of liquid in the nitrometer was always 17 C.c., or very little less.

The correction for solubility in this volume of liquid was found by using for two estimations exactly the same quantity of ethyl nitrite, but in the second an increased quantity of absorbing liquid. The difference in the two volumes of nitric oxide is taken as the solubility of the gas in the quantity of liquid denoted by the increase. Two trials showed practically the same solubility, and further assays gave very nearly the same result. The method is objectionable, as involving the error always attending the assay process, but has the merit of having been made under *precisely* the same conditions as the working assays themselves. The figures adopted are, for the reason given, only approximate:

No.	Maker.	Gm. in 100 C.c.	C.c. used.	Temperature.	Barometric Pressure.	C.c. No. Observed	C.c. No. Corrected.	Per cent $C_2H_5NO_2$.	Per cent claimed or Indicated.	Dilution Directed.	Per cent $C_4H_5NO_2$ in Spirit.
1	A	3.192	3.53	24° C.	752.8	33.6	30.25	90.20	90	1x19	4.5
			3.53			33.5	30.17	89.97			
		2.707	4.07			32.7	29.46	89.94			
			4.00			32.0	28.85	89.52			
2	A	3.211	3.52	20° C.	751.8	33.7	31.01	92.19	90	1x19	4.6
			3.50	19° C.		33.2	30.60	91.51			
		3.360	3.63	18° C.	752.6	35.9	33.23	91.54			
			3.52	17° C.		34.5	32.12	91.25			
3	A	3.365	3.50	17° C.	752.6	33.8	31.47	89.78	90	1x19	4.5
			3.55			34.2	31.87	89.64			4.5
		3.050	3.52	18° C.	750.3	31.1	28.77	90.04			
			3.51			31.0	28.69	90.04			
4	B	4.795	3.51	19° C.	751.8	32.1	29.61	59.11	U. S. P.	1x19	3.0
			3.50	18° C.		31.8	29.47	59.00			
		5.530	3.51	19° C.	753.6	37.0	34.12	59.06			
			3.52	20° C.		37.0	33.97	58.64			
5	B	3.634	4.04	19° C.	752.3	27.8	25.74	58.91	U. S. P.	1x19	3.0
			4.05			27.8	25.74	58.76			
		3.692	4.00			28.0	25.92	58.97			
			4.00			28.0	25.92	58.97			
6	C	2.536	4.05	19° C.	755.6	15.6	14.75	48.24	U. S. P.	1x19	2.4
			4.15			15.9	15.03	47.98			
		4.832	4.00	19° C.	754.4	29.6	27.54	47.87			
			4.00			29.4	27.27	47.41			
7	D	5.968	4.05	18° C.	751.8	21.35	19.95	27.69	U. S. P.	1x19	1.4
			4.05	17° C.		21.1	19.84	27.58			
		5.102	4.00	20° C.	757.0	18.2	17.07	28.10			
			4.00			18.0	16.90	27.82			
8	E	5.064	4.02	18° C.	760.0	14.7	14.08	23.28	No Claim	1x10	2.12
			4.00			14.5	13.90	23.05			
		5.063	4.05	18° C.	760.0	14.8	14.17	23.22			
			4.05	19° C.		14.8	14.11	23.12			
9	F	Undiluted Sp. Gr. .883	5.00	19° C.	751.8	3.15	3.42	.260	U. S. P.	1x19	.013
			5.10			3.20	3.47	.259			
10	F	Undiluted Sp. Gr. .870	5.00	17° C.	757.0	7.40	7.38	.570	U. S. P.	1x19	.0285
			5.00			7.35	7.33	.565			

TEMP. = 20° C. PRESSURE = 757 Mm.

Spirit used.	Volume of Gas.	Volume of Liquid.
1st. { 2.00 C.c.	21.95 C.c.	10 C.c.
1st. { 2.00 C.c.	21.50 C.c.	22 C.c.
	.45 C.c. gas soluble in 12 C.c. liquid.	
2d. { 2.00 C.c.	21.90 C.c.	10 C.c.
2d. { 2.00 C.c.	21.50 C.c.	21 C.c.
	.40 C.c. soluble in 11 C.c. liquid.	

23 C.c. of liquid dissolves 0.85 C.c. gas, or 17 C.c. dissolves .63 C.c., equalling 0.57 C.c. dry gas at 0° C. and 760 Mm. pressure. This volume is added to the observed volume after their correction. 0.336 Gms. $C_2H_5NO_2$ yield 100 C.c. NO at 0° C. and 760 Mm. pressure. On this is based the equation:

$$\frac{\text{Cc. NO} \times .336}{\text{wt. of ether used}} = \text{per cent } C_2H_5NO_2 \text{ in that ether.}$$

An example will fully explain all calculations:

No. I.: 3.192 in 100 C.c., 24° C., 752.8 Mm.
1st assay — 3.53 C.c. gave 33.6 C.c. NO
2d " — 3.53 C.c. " 33.5 C.c. "

Corrected for temperature, pressure, vapor tension, and solubility.

1st — 3.53 C.c. gave 30.25 C.c. NO
2d — 3.53 C.c. " 30.17 C.c. "

$$1st = \frac{30.25 \times 0.336}{.1126776} = 90.20\% \ C_2H_5NO_2$$

$$2d = \frac{30.17 \times 0.336}{.1126776} = 89.97\% \ C_2H_5NO_2$$

(.1126776 = 3.53 × .03192. 3.53 = volume of the dilution used: .03192 = wt. of ether in one C.c. of dilution.)

In the column of percentages, the figures given are for total nitrites, though simply stated as ethyl nitrite.

Of the ten packages examined, three bore an assay label, and these tested

fully up to the value claimed. The remainder made *no* claim to any definite percentage, but the purchaser is assured that they are *strictly* U. S. P. in every respect, number 8 excepted, the directions for dilution placing its value at half that strength. Four—both from one source—are so very *poor* in ether that they may be dropped out of comparison with the remaining five. To these attention is directed, as all, with the exception noted, purport to be the same thing, and, aside from an accurate assay, give no positive evidence of being otherwise. The spirit obtained by dilution as directed contains from 1.4 per cent to 3 per cent of ethyl nitrite, while the officinal standard based on the lowest limit is 4 per cent (labelled or claimed as U. S. P.). Just what percentage of absolute ethyl nitrite the washed ether of the pharmacopœial process usually contains appears as yet to have been undetermined. An inquiry, addressed to Prof. Lloyd, was referred to Dr. Rice, who in turn referred to an article by H. B. Parsons (NEW REM., 9, 83) in which it is shown that the unwashed ether may contain 63 per cent of nitrous ether, but the percentage in the washed ether is not named, and no minimum percentage is fixed. It would appear from this that the officinal quantitative test should show 3 per cent and not 4 per cent. Upon what assays the latter percentage was based the writer was unable to learn.

However, until proven conclusively by assay of a large number of samples of washed ether that it does not reach 80% pure ethyl nitrite, the quantity inferred from the officinal formula and test, it is the duty of the pharmacist to supply a 4% spirit, however this may have been obtained. The officinal product, and not the officinal formula is our standard.

Other properties being equal, there can be no objection to using commercial nitrous ether in preparing the spirit, provided it bear a truthful assay label; but whether several of the manufacturers would be willing to affix this to each package is doubtful, if the specimens examined represent their average product. If it were done, then the responsibility for a strictly officinal spirit would rest upon the purchaser, the pharmacist. Until manufacturers do this, but one decision can be based upon the result of the assays: Commercial concentrated nitrous ether is too variable in strength to merit our confidence, and its use for the purpose intended is to be discouraged.

At the suggestion of Prof. Lloyd, a large number of samples of recently made washed nitrous ether to be obtained from his laboratory, and perhaps from the laboratories of other manufacturers, will be assayed and the limits fixed within which a strictly officinal ether, and therefore spirit, must be found. The operator hopes to be able to present his report at the next annual meeting.

Bottle-Cement.—A cement especially valuable for bottles holding volatile liquids may be made by mixing finely-ground litharge with glycerin. It is used by painting it about the joint between the stopper and the lip or neck of the bottle. It dries rapidly, becomes brittle, and can readily be detached and scraped off with a spatula when it becomes necessary to open the bottle.

Moulding of Syrup of Rhubarb is prevented by Aug. Drescher by adding borax in the same proportion as carbonate of potassium.—*Drug. Cir.*

[The use of borax, for this purpose, or for keeping preparations of rhubarb and similar drugs, has also been introduced some time ago in Germany.—ED. AM. DR.]

THE DANGER OF OMITTING DIRECTIONS, ETC., FROM PRESCRIPTIONS.*

BY S. J. BENDINER, OF NEW YORK.

"Several fatal accidents have recently occurred, which are in part due to the fact that prescribing physicians frequently omit from their prescriptions the name of the patient for whom the medicine is intended, and such directions as would indicate the manner of using, or the dose. What means may be employed to induce physicians to add these data in all cases, or at least whenever the prescription contains an energetic constituent?"

THE importance of this query is recognized by every experienced pharmacist, and the wonder is why this question has not been asked long, long ago, as it is a matter of almost daily occurrence that just such prescriptions as are indicated above, are presented in pharmacies, some of which, if dispensed without proper inquiries on the part of the dispenser, would jeopardize the life of the patient and the name and fame of both prescriber and compounder, but owing to the tact and good judgment of the latter, fatal accidents resulting through careless prescribing are often avoided.

Still, the practice of physicians to omit the most explicit instructions as to the use, and the name of the person for whom his prescription is intended, in all cases where energetic constituents are employed, ought to be abolished in the interest of the medical and pharmaceutical professions. It matters little how discreetly and diplomatically the dispenser questions the patient or his representative who presents such a suspicion-arousing recipe, as the latter is ever on the alert to fancy "something wrong" in the prescription, and who then, in his turn, generally interrogates: "Why do you ask—is it—Poison?"

The reason why such neglect in prescribing prevails, and is countenanced at all by the pharmacist is, because he tacitly understands that the prescriber has assumed all responsibility in the case, and that the patient or his attendant knows all about the medicine. But I have my grave doubts whether the dispenser, in a case of accident, would be held blameless by a court of law for filling an important order, and in the absence of directions upon that prescription, neglects to make due inquiry as to the proper employment of such potent agents. In the face of this, the physician, as a rule, resents close questioning on the part of the druggist as an undue interference with his business, by a withdrawal of his patronage from the store of the intermeddler. Nevertheless, such intermeddling by the pharmacist is justified, is legitimate, and is one of his prerogatives, which he is bound to excise until a practice is stopped for which the following two cases, out of many which occurred either in my own or in a pharmacy where I was employed as clerk, may serve as illustrations:

℞

Plumbi Acet., ℥ i.

Dr.... .....

In the absence of any written directions as to the use of the sugar of lead, the party presenting the prescription was asked how the article was to be used, whereupon he promptly replied that it was *to be taken* in teaspoonful doses for kidney trouble! Of course the physician *meant* to write *potassii acetas* instead of *plumbi acetas.*

The other case in point was a prescription *with full directions* for a number of powders to contain among other, though harmless, ingredients, six grains of pulv. Doveri in each powder. During its preparation the versatile female servant kept up a voluble conversation, and accidentally dropped the unsolicited and startling information that the powders were for the baby, a few weeks old!

Well, we did not dispense those powders, and lost our customer and the physician, yet we saved the doctor's reputation, let alone the baby.

To recapitulate, had the physician in the first case *written the directions* upon the prescription, and in the second mentioned in writing the name of the patient, namely: "Infant ——" no blunder could possibly have been made by a careful dispenser. It is, therefore, not only on account of the doctor and the pharmacist, but primarily on account of the *patient*, that I advocate a reform which will do away at once, and for all time, with such vague prescription writing.

Were our governments, State and National, patriarchal like those of the continent of Europe, we might perhaps successfully petition Congress and the Legislature to enact a law similar to the one enforced in Germany, which not only compels the prescriber to write the name of the patient upon the prescription, but also insists that he underline an eventual excess of the maximum dose of an active drug allowed in the Pharmacopœia. Even if this step were undertaken, to seek relief in the way of National and State Legislation, it would take years perhaps of agitation and persistent efforts to obtain it.

But we can succeed much sooner by a direct appeal to the practitioners of medicine and professors of Medical Colleges of the State. This is the high mission of our State Pharmaceutical Association. Let our President appoint a committee, consisting of members professionally well known throughout the State, for the purpose of issuing a circular in the name of this Association, and addressed to every practising physician and teaching professor of a medical college, setting forth the grave points here discussed, and requesting them to hereafter write the name of the patient, and in case of energetic constituents, the full directions upon their prescription.

I have no doubt that, if this is properly and respectfully brought to the notice of the medical profession, each and every physician will cheerfully comply with our request. Let the Empire State move in this matter first, as it has moved in the matter of the now national "Formulary," and be just as successful.

* Read at the meeting of the N. Y. State Pharm. Assoc., in reply to Query No. 49.

Poison-Closets.

AUGUST DRESCHER has had much satisfaction from the following arrangement of poison-closets. Two closets are provided. In one is kept hydrocyanic acid; cyanide of potassium; preparations of arsenic; mineral acids; carbolic, cresylic, oxalic, and chromic acids; silver salts; opium and its preparations; iodine, and certain powerful tinctures, extracts, powders, and pills containing poisons. In the second closet are three subdivisions containing minor poisons and substances which are dangerous rather than strictly poisonous: *e. g.*, chloroform, iodoform, ethers, collodion, cantharidal collodion, wood naphtha, chloral hydrate, butyl chloral, cantharides, narcotic herbs, roots and seeds, euphorbium, cowhage, and the oils of tansy, pennyroyal, croton, and bitter almonds.—*Drug. Cir.*

APPARATUS FOR THE DETERMINATION OF MELTING POINTS.

GUSTAV OLBERG has constructed an improved apparatus for determining melting points, in which the liquid surrounding the thermometer and the substance to be examined is kept in motion by a current caused through heat, instead of by means of mechanical stirring.

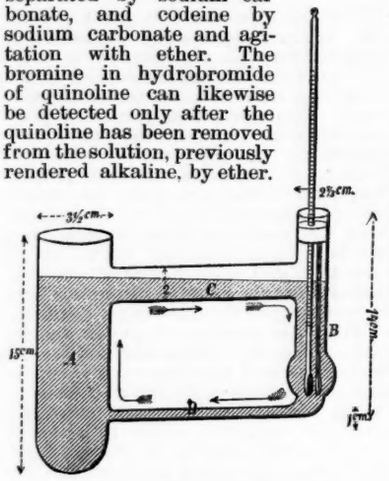
The apparatus consists of two glass tubes joined by an upper, rather wide lateral tube, and by a lower narrow one, of the shape and dimensions shown in the cut. The tube *B* has an expansion in its lower portion, so that the bulb of the thermometer and the bulb containing the substance may be surrounded by an ample volume of the circulating liquid. When heat is applied to the tube *A*, the liquid will ascend, and a current will be established towards *C*, *B*, and *D*, in the direction of the arrows. This current will constantly change the liquid surrounding the bulbs at *B*, so that all stirring is rendered unnecessary. The neck of the tube *B* is a little longer than that of *A*, because the cork which holds the thermometer and melting tube needs some room to slide up and down in. The observer should place the apparatus so that *B* is nearer to him than *A*. Since it is known that thermometers require a little time to follow the rise of temperature, it is best to first examine substances of known melting point, and to adjust the rate of immersion of the thermometer, as compared with the position of the melting tube so that the correct temperature will be indicated.—*Rep. d. Anal. Chem.*, 1886, 94.

Method of Testing for Bromine in the Hydrobromides of Certain Alkaloids.

DR. A. WELLER, connected with Zimmer's quinine works in Frankfurt o. Main, reports that a customer of the firm had returned some hydrobromide of quinine which he claimed did not contain any bromine at all, while it was, on the contrary, perfectly pure. As is well known, one of the most commonly used methods to detect bromine in combination is to add to the compound some chlorine water (which liberates the bromine), and then some bisulphide of carbon, which dissolves it with a characteristic color. Heretofore it had not been pointed out in chemical literature, that the above-mentioned method fails to detect the presence of bromine in the hydrobromides of certain (and perhaps most) alkaloids. Iodine is, however, quite readily detected in this manner, but care must be taken that the solutions are dilute and rather strongly acidulated with hydrochloric acid. Only in this case will the violet coloration of the bisulphide become plainly distinguishable. In concentrated, or in but feebly acidulated or neutral solutions, addition of chlorine water produces copious precipitates of brown periodides, which are apt to mislead, as they are dissolved by bisulphide of carbon with a violet-brown or dark-brown color. But when this precipitate is produced in a dilute acid solution, it does not interfere with the reaction.

Dr. Weller now points out that, when the above-mentioned test for the presence of bromine is performed *in presence of cinchona alkaloids, no color is imparted to the bisulphide of carbon.* The reason is this, that the liberated bromine combines at once with the alkaloids, forming bromated bodies which yield up no color to the bisulphide. The four principal cinchona alkaloids, *quinine*, *quinidine*, *cinchonine*, and *cinchonidine*, behave exactly alike in this respect. And it is, moreover, immaterial, whether their solutions are concentrated or diluted, neutral or acidulated (with HCl or HBr). Yet the presence of bromine may be easily and certainly proved, if the alkaloids are first removed by soda, and the filtrate, after being acidulated, treated in the usual manner.

According to Dr. Weller, the bromine reaction fails to show itself also, under similar conditions, in solutions of the hydrobromides of morphine, codeine, strychnine, and brucine. In these cases, the bromine may likewise be easily detected, if the alkaloids be first removed. For this purpose, strychnine and brucine may be precipitated by soda; morphine must be separated by sodium carbonate, and codeine by sodium carbonate and agitation with ether. The bromine in hydrobromide of quinoline can likewise be detected only after the quinoline has been removed from the solution, previously rendered alkaline, by ether.



G. Olberg's test for melting points

On the other hand, the bromine reaction succeeds without difficulty in solutions of the hydrobromides of caffeine, cocaine, atropine, coniine, and pyridine. It is, however, advisable, in these cases, to use dilute and acidulated solutions, in order to avoid turbidity or precipitates which might be produced by the chlorine or liberated bromine.

Even in the case of codeine and the other alkaloids mentioned in connection with it, the addition of chlorine water sometimes causes secondary effects. For instance, a neutral solution of hydrobromide of codeine is colored rose-red by chlorine water; solution of brucine is colored red by chlorine and bromine, and in solution of strychnine a white turbidity or precipitate is produced by chlorine.—Abstract from *Arch. d. Pharm.*, 224, 161.

Tannate of Quinidine.

THE following method for preparing this tasteless compound is given by Dr. Hager as an improvement on the formula laid down in his *Pharmaceut. Praxis* (suppl., pp. 274).

Dissolve 40 parts of sulphate of quinidine in 1,000 parts of water with the aid of 20 parts of diluted sulphuric acid (1 acid, 5 water). Also dissolve 87 parts of very dry (or 89 parts of powdered and air-dry, or, rather, air damp) tannic acid in 1,000 parts of distilled water. Filter the latter solution, if necessary, and dilute it afterwards with 1,000 parts of warm distilled water. Finally, dissolve in a separate vessel 15 parts of bicarbonate of sodium in 500 parts of distilled water. All three solutions standing at hand, pour the bicarbonate of sodium into the tannic acid solution, stir quickly, and, keeping up the stirring, pour into it the solution of quinidine sulphate, in a thin stream. Let the mixture settle during 24 hours, then transfer it to a strainer, pouring back the strained liquid until this runs off clear. Wash the precipitate remaining upon the strainer with 1,500 parts of distilled water. When the liquid has drained off as much as possible, fold the strainer together and subject it to a very gradually increased pressure. The expressed liquid is usually somewhat turbid; it is, therefore, allowed to settle by setting it aside in a cool place for 2 or 3 days, the supernatent liquid then poured off, and the small remaining precipitate collected on a separate small filter. When the strainer has been folded together, it is best to place it between two thick layers of bibulous paper, or between two thin layers of this and porous tiles, pressure being produced by the gradual imposition of iron weights. If the mass were pressed tightly at once, the strainer would burst, as the water inclosed inside would not have time to penetrate through the mass to the outside.—After *Pharm. Centralh.*, 1886, 177.

Austrium: A New Element.

AMONG the papers of the late Dr. Linnemann, Professor of Chemistry in the University of Prague, has been found a communication addressed to the Royal Academy, and bearing the title, "Austrium, a new metallic element." It describes a new metallic element obtained by the deceased from arthite from Arendal, having a spectrum with two characteristic lines in the violet, one of which is fairly coincident with an unidentified line in Angström's atlas. It is stated that the paper will be published in the transactions of the Academy.—*Pharm. Journ.*

Salt and Borax in Nevada.

IF the salt formations of Nevada were in railroad communication, there would be no market in this country for the foreign article. In Lincoln County, on the Rio Virgin, there is a deposit of pure rock salt, which is exposed for a length of two miles, a width of half a mile, and is of unknown depth. In places, cañons are cut through it to a depth of sixty feet. It is of ancient formation, being covered in some places by basaltic rock and volcanic tufa. The deposit has been traced on the surface for a distance of nine miles. It is so solid that it must be blasted like rock, and so pure and transparent that print can be read through blocks of it a foot thick. At Sand Springs, in Churchill County, there is a deposit of rock salt fourteen feet in depth, free from any particle of foreign substance, which can be quarried at the rate of five tons a day to the man. The great Humboldt salt field is about fifteen miles long by six wide. When the summer heats have evaporated the surface water, salt to the depth of several inches may be scraped up, and underneath it a stratum of pure rock salt of unknown depth. Soda, borax, and other valuable minerals also exist in large quantities near these localities, and branch railroads will sooner or later bring them into market. A considerable business in gathering borax is already established on the line of the Carson and Colorado Railroad. If Nevada will cut down her working expenses and develop her natural resources, she will be above the necessity of seeking land grants from her neighbors or from the general Government. — *San Francisco Bulletin.*

Poisoned Honey.—At a recent meeting of the Dresden Agricultural Society, a local druggist reported that, in a neighborhood where the deadly nightshade grew abundantly, the bees had incorporated with the honey sufficient poison from these flowers to account for numerous and occasionally fatal cases of poisoning. He also stated that gelsemium had been detected in American honey [all of which is extremely doubtful.—ED. AM. DRUGGIST].

ON THE MANUFACTURE OF HYPOPHOSPHITES.*

BY THOS. D. M'ELHENIE, OF BROOKLYN.

In reply to query No. 63, I beg to say that so far as I have been able to learn, the decline in price of the hypophosphites is chiefly due to the increased production of phosphorus. By closer attention to details and mechanical improvements in the manufacture, the percentage of yield has been increased and the price reduced accordingly, purely on commercial grounds and as a result of competition. Phosphorus is not now produced in the United States. This market is supplied from England and Germany, both with phosphorus and calcium hypophosphite. The salt is made as it probably always has been by boiling phosphorus in milk of lime, phosphuretted hydrogen escaping and igniting, phosphate of lime being deposited and hypophosphite remaining in solution, to be obtained by filtration and evaporation. The salt reaches this country practically pure, and the less important hypophosphites are made here from the lime salt by the different manufacturing chemists. The following data, furnished me by Mr. Williston, with Charles Pfizer & Co., of New York, show why it would not pay to manufacture the hypophosphites in this country directly from phosphorus. According to the theoretical weights, 62 lbs. of phosphorus should yield 85 lbs. hypophosphite of lime, but in practice it is far from being the case. A maximum yield may safely be put as 1 lb. for each pound of phosphorus employed, while Mr. Williston tells me it will often require nearly 1¼ lb. of phosphorus to make 1 lb. of the lime salt. The prices given below are based upon the New York and London markets for about May 1st, 1886.

Price of Phosphorus in London, 2s. 4d.	.58
Add about 10% for Lime, labor, etc....	.06
	.64
Duty 25% ad val. on Hypophosphite ..	.16
Cost to import..... ..	.80
Price of Phosphorus in London.	.58
Specific duty per pound..... ..	.10
	.68
Add for Lime, waste, etc., 10%.	.07
	.75
For labor in United States.....	.25
Cost to make here..... .....$1.00	

It would be difficult, perhaps impossible, for an American retailer to procure any statistics of product of any given chemical from foreign manufacture. It is estimated that the importation of calcium hypophosphites into the United States is about six thousand pounds annually. The principal makers are Typke & King, London; E. Merck, Darmstadt, and E. DeHaen, Hanover.

Care of Poisons.

"The way we are keeping the most dangerous poisons—and it works very well indeed—is to put them on a top shelf in a compartment by themselves—a kind of poison cabinet, with a door to keep out dust and light. It is as high as the main shelving, being a part of it, and the dispenser has to use a short step-ladder in order to reach the bottles, which are to be replaced as soon as the required quantity has been weighed out and checked by two persons."—O. M. Olson, *Nat. Druggist.*

* Read at the meeting of the N. Y. State Pharm. Association.

[Original Communication.]

EMULSIONS.

BY CHAS. T. P. FENNEL, PH.G., OF CINCINNATI,

Prof. of Practical Pharmacy, etc.

The adoption and indorsement of the New York and Brooklyn Formulary by the American Pharmaceutical Association, making it national in its character, justifies the offer of a few suggestions on the subject. The members of the various committees have undoubtedly given much of their valuable time and expended considerable material in *causa honoris*, and are deserving of the highest praise for their efforts in establishing a formulary that will place all so-called "elegant pharmaceuticals" on a uniform basis. These formulæ are offered as a substitute for the vile nostrums introduced by the manufacturing pharmacists, under the title of elegant preparations, and as such are supposed to be based on strictly pharmaceutical principles, their names indicating the nature as well as the constituents of the preparation. Under these circumstances, I felt skeptical as to the permanency of the class called emulsions. According to pharmaceutical principles, an emulsion is considered a mere mechanical mixture of an oil, fat, or resin with water, the admixture being promoted and rendered permanent for a greater or less period of time by the presence of a gum or an equivalent substance; permanency depending on the quantity of gum or its equivalent. Taking this as a basis, I felt satisfied that formula No. 53, Stronger Emulsion of Cod-Liver Oil, was not a satisfactory one, and would not produce a true emulsion. Nevertheless, I prepared the mixture according to the formula, adhering strictly to the directions given. After triturating thoroughly for ten minutes, continuously in the same direction, I concluded that emulsification had taken place, and finished the preparation as directed. After one hour, the mixture began to separate, and after eighteen hours, showed two almost equal layers. The experiment was repeated, the result always the same, complete separation taking place between sixteen to thirty hours, depending on the time of trituration; clearly demonstrating the want, or rather the insufficient supply, of the emulsifying agent.

Emulsion of castor oil and of oil of turpentine were likewise prepared, and in every instance strictly following the directions of the formula. The result in both cases very unsatisfactory—the turpentine emulsion separating completely within five minutes. Formula No. 54 also offers a very objectionable feature, namely, the addition of essential oils. This addition to a completed emulsion has a great tendency to bring the globules of oil together, inducing the oil of the emulsion proper to combine, breaking the mixture of already emulsified oil. Another objection might be raised to the use of avoirdupois weight without specifying system of measure.

Some years ago, under the direction of Prof. A. Fennel, I had ample opportunity for determining the quantity of gum necessary to produce a perfect and permanent emulsion in the shortest period of time.

Success depends largely on forming the nucleus, and special care should be exercised in determining the quantity of gum and water necessary to emulsify the prescribed quantity of oil.

Stronger emulsion of cod-liver oil, prepared according to the following formula, will give a very satisfactory product:

Cod-liver oil, four fluid oz., wine measure.
Acacia, in very fine powder, two troy oz.
Water, enough to make eight fluid oz.

Place the Acacia in a dry mortar, and add the oil gradually, triturating continuously to a uniform smooth paste. Then add three fluidounces of water at one time, triturate continuously until the oil is emulsified. This is accomplished in about one minute, and complete emulsification indicated by crackling sound while triturating. Finally, add enough water to make the product measure eight fluidounces wine measure, being careful not to use the oily graduate, otherwise the perfect emulsion will very soon be broken up. This product will keep for months without the least indication of separating, and form a true stock emulsion.

The proportion for forming the nucleus of an emulsion of a fixed oil, balsam, or oleoresin may be expressed as follows: Oil, 1; gum, ½; water, ¼; the emulsion is quickly made. An addition of water to this nucleus will not produce any separation. Emulsions of essential oils require a larger amount of gum, the proportions may be expressed as follows: Oil, 1; gum, 1 to 1½; water, 1 to 1½; these are also quickly made, and are permanent and palatable.

SUMMARY OF PHARMACOPŒIAL PREPARATIONS RARELY OR NEVER USED.*

BY GEORGE W. SLOAN, M.D., OF INDIANAPOLIS.

The committee to whom was given the work of revising the Pharmacopœia for 1880, in their preface made a request of "all dealers in medicines that on or about the first day of January of the years 1884 and 1889, they will report to the chairman of the committee a list of those articles and preparations which have not been used at all, and of those seldom prescribed previous to those dates."

Feeling this subject might prove of interest to the members of this association, and hoping it would be a means of stimulating others to a like work, I have prepared the following list.

As to drug articles, it is the writer's opinion that as the country for whose use the Pharmacopœia is intended is extensive, so should the list of medicinal agents be sufficiently so, in order that the whole people should have the benefit of well described and useful remedies.

He also believes that if the pharmacists were as industrious in calling the attention of physicians to the various new introductions into the Pharmacopœia as the manufacturers are with their productions, it is probable many articles named as rarely or never used, would be stated otherwise.

Again, the writer believes that once in ten years is too frequent to make radical changes in the Pharmacopœia, for we seem hardly used to one set of formulæ and names before there comes a change in methods and proportions.

The following list contains the preparations that are rarely or never called for at my place of business:

RARELY USED.

Abstractum Digitalis,
Abstractum Hyoscyami,
Abstractum Jalapæ,
Acetum Opii,
Acidum Chromicum,
Æther Aceticus,
Aluminii Hydras,
Amylum Iodatum,
Aqua Amygdalæ Amara,
Argenti Nitras Dilutus,
Argenti Oxidum,
Ceratum Sabinæ,
Charta Cantharidis,
Charta Potassii Nitratis,
Collodium Stypticum,
Cupri Acetas,
Decoctum Sarsaparillæ,
Emplastrum Ferri,
Ext. Chiratæ Fld.,

* Read before the Indiana Pharm. Assoc.

Ext. Hæmatoxyli,
Ext. Sabinæ Fld.,
Ferri Carbonas Saccharatum,
Ferri Iodidum Saccharatus,
Ferri Oxalas,
Glyceritum Amyli,
Glyceritum Vitelli,
Hydrargyri Cyanidum,
Hydrargyri Sulphidum Rubrum,
Linimentum Belladonnæ,
Linimentum Cantharidis,
Linimentum Sinapis Comp.,
Liquor Ferri Nitratis,
Liquor Gutta-Perchæ,
Liquor Sodii Arseniatis,
Mel Rosæ,
Mistura Ammoniaci,
Mistura Amygdalæ,
Mucilago Cydonii,
Mucilago Sasafras Medullæ,
Picrotoxinum,
Pulvis Morphinæ Com.,
Pulvis Rhei Com.,
Quininæ Hydrochloras,
Sodii Arsenias,
Sodii Santoninas,
Spiritus Myristicæ,
Syrupus Allii,
Syrupus Ferri Bromidi,
Syrupus Lactucarii,
Tinctura Ipecac. et Opii,
Tinctura Physostigmatis,
Tinctura Sumbul,
Unguentum Acidi Gallici,
Unguentum Acidi Tannici,
Unguentum Chrysarobini,
Unguentum Mezerei,
Unguentum Plumbi Carbonatis,
Vinum Aloes,
Vinum Antimonii,
Vinum Aromaticum.

NOT USED.

Abstractum Aconiti,
Abstractum Belladonnæ,
Abstractum Conii,
Abstractum Ignatiæ,
Abstractum Nucis Vomicæ,
Abstractum Podophylli,
Abstractum Senegæ,
Abstractum Valerianæ,
Acetum Lobeliæ,
Acetum Sanguinariæ,
Aqua Creasoti,
Ceratum Camphoræ,
Decoctum Cetrariæ,
Emplastrum Ammoniaci,
Emplastrum Ammoniaci cum Hydrargyro
Emplastrum Asafœtidæ,
Emplastrum Picis cum Cantharide,
Ext. Rosæ Fld.,
Glycyrrhizinum Ammoniatum,
Linimentum Terebinthinæ,
Mistura Chloroformi,
Mistura Rhei et Sodæ,
Mucilago Ulmi,
Physostigminæ Salicylas,
Syrupus Aurantii Florum,
Syrupus Calcis,
Tinctura Chiratæ,
Tinctura Croci,
Tinctura Ignatiæ,
Tinctura Pyrethri,
Trochisci Acidi Tannici,
Trochisci Cretæ,
Trochisci Ipecacuanhæ,
Trochisci Magnesiæ,
Trochisci Sodii Santoninatis,
Unguentum Sulphuris Alkalinum.

Indestructible Paste for Closing Letters.

LETTERS or envelopes which it is desired to to protect against unauthorized opening (by moistening the pasted portion), may be securely sealed by using a solution of oxide of copper in ammonia as paste. This liquid has the faculty of dissolving cellulose. When applied to the paper it dissolves the cellulose on the surface, and on drying the two partially dissolved surfaces adhere indissolubly together.

The same thing may be accomplished by using water-glass (silicate of soda or potassa). In this case the chemical action is different, but when it is completed, the pasted surfaces cohere as permanently as in the preceding case.—After *Pharm. Zeit.*

Glycerin is employed in the dyeing of calico as a solvent for arsenious acid, six pounds of the acid being soluble in a gallon of good glycerin.

ON THE ESTABLISHMENT OF A DRUGGISTS' EXCHANGE BUREAU.

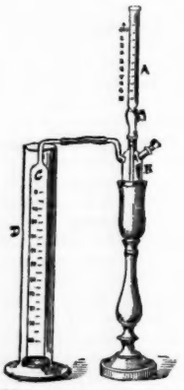
BY A. SAGER, OF CORTLAND, N. Y.*

> "In view of the fact that druggists frequently change their location, that drug stores are frequently sold and purchased, and that such sale or purchase is usually attended by a broker's commission, which yields no benefit to the druggist, but rather offers an opportunity for collusion and fraud on the part of the broker, is it not possible, and would it not be desirable to establish a Bureau of Exchange under the auspices of the various County, State, and National Associations?"

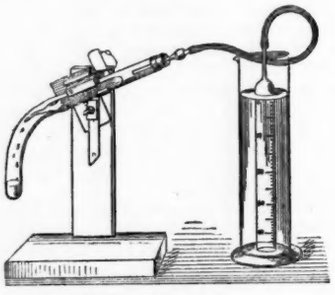
BEFORE answering the above question, I desire to state that I believe in making our Association as valuable to its membership as possible without derogating from the original purpose of its Organization, viz.:

First, The elevation of Pharmacy as a profession.

Secondly, The promotion of the interests of pharmacists throughout the country, socially and materially.



Apparatus for assaying hydrogen peroxide.



Bellamy's ureometer.

Already several important measures have been secured. The passage of a Pharmacy law by our State Legislature (the result of untiring effort on the part of our Committee of Legislation) has done much to secure the first object named. Our annual meetings and the efforts now being made to secure thorough organization in every county throughout the State will eventually secure the latter.

While it is possible to establish a Bureau or Agency for the purposes named in the query, the question remains, Would it be desirable? After careful consideration I am of the opinion that the Association is not at present prepared to take upon itself the responsibility and work involved in the establishment of such a Bureau or Agency.

However, I trust the time is not far distant when we shall be so thoroughly organized in every portion of the State that the plan suggested in the query may be practicable and afford reliable means of communication between seller and buyer.

* Read in answer to Query No. 44, at the meeting of the N. Y. State Pharm. Association.

ASSAY OF PEROXIDE OF HYDROGEN.

HYDROGEN peroxide, which is now frequently used in surgical practice as well as in the arts, may be assayed in the following manner, and by the use of the apparatus here described.

One part of the apparatus consists of a tube *A* holding 10 C.c., and divided into $\frac{1}{10}$. This is provided with a stop-cock, and is fitted, by grinding, air-tight into the neck of a glass vessel *B* having two lateral tubulures, one of which is closed with a stopper, while the other is connected by rubber tubing with an inverted burette graduated to 100 C.c. placed into a cylinder full of water.

When the apparatus is to be used, a small quantity of finely-powered dioxide (black oxide) of manganese is introduced into *B* through the free lateral aperture, the latter closed, and a sufficient quantity of peroxide of hydrogen poured into the tube *A*—say, for instance, 10 C.c. The water in the cylinder *D* is then adjusted so that it will stand exactly at the mark 0. (While adjusting the level of the water, the stopper in the lateral neck of *B* should be loosened to permit escape or access of air. And when it is reinserted, care must be taken that the zero point does not appear depressed.) The faucet of the tube *A* is now opened, and a definite amount of the liquid, say 1 C.c., allowed to flow on the oxide of manganese. Oxygen gas is immediately given off, and the evolution will be concluded after two to three minutes, if the apparatus is well agitated. [It is advisable to lift the burette *C* a little upwards, to rarefy the air contained in the apparatus. The generated gas will then have no tendency to press upwards against the liquid in the tube *A* when the faucet is open.] When no more gas is given off and no further portion of the liquid is to be admitted (in the case of weak solutions more will have to be taken), the burette *C* is lifted high enough, so that the level of the water, inside and outside, is the same, and the volume of oxygen then read off. Temperature and pressure should be taken notice of when accurate results are desired.—*Journ. Pharm. et Chim.* [5], 12, 501.

A NEW FORM OF UREOMETER.

FELIX BELLAMY has devised the apparatus here illustrated for the purpose of estimating urea.

2 C.c. of the urine to be examined are put into a curved tube, closed at a curved end, the tube being held by a clamp so that it may be placed at any inclination. The bromated soda solution is contained in a pipette or tube closed at one end, and when the apparatus is properly inclined, falls into the urine in drops, causing the evolution of gas, which is caught in the inverted graduated cylinder in the usual manner. The advantage of this apparatus is this, that the rate of access of the bromine solution may be regulated at will.—*Journ. Pharm. et Chim.* [6], 13, 178.

Benzoated Lard.

IN reply to query 20 of the New York State Pharm. Assoc., "whether benzoated lard could be prepared by substituting benzoic or cinnamic acid for the benzoin," Mr. Charles Khuen reports that pure lard treated with benzoin keeps much better than that treated with either benzoic or cinnamic acid, or with a mixture of these two. He also found that samples which had been stored in the cellar kept better than those in the store, and that such as had been put in earthenware jars had kept better than those in glass vessels.

NOTES ON PRACTICAL PHARMACY.*

(Continued from p. 106.)

LINIMENTS.

LINIMENTS, *Linimenta*, are prepared either by simple mixing in a glass, or by mixing and trituration in a mortar. A mixture mortar should be devoted exclusively to the preparation of liniments. The portions of the liniment which adhere to the pestle and mortar may be scraped together with a piece of stiff cardboard.

Liniments are formed when fluid caustic ammonia is mixed with fatty oils. If an alcoholic tincture or a large quantity of ethereal oil is to be added to the liniment, the latter must first be thoroughly mixed. If these ingredients were mixed with the oil and the ammoniacal fluid then added, the liniment would be less intimately mixed, and would separate into layers by standing.

LIME-WATER, mixed with fatty oils, likewise makes a uniform liniment, as does acetate of lead. The whole of the lime-water must always be shaken briskly with the entire quantity of the oil with which it is to be mixed. Should it first be shaken up with part of the oil, and the rest of the oil added afterwards, a homogeneous liniment will seldom be obtained.

The *extracts* to be mixed with liniments should be first dissolved in the watery elements of the liniment or, if the prescription does not order any, diluted with water to a thin magma.

OINTMENTS.

OINTMENTS, *unguenta*, are homogeneous mixtures prepared from fats and other materials, which are of stiffer consistence than liniments and softer than plasters. Lard or oils thickened with wax are usually the chief constituents of salves.

Ointments are mixed in porcelain [or wedgewood], which should be exclusively used for mixing fatty substances. They should be cleansed by being rubbed out with fine wood shavings [sawdust or "excelsior" packing], wiped off with a cloth, and then washed with a solution of soda and water.

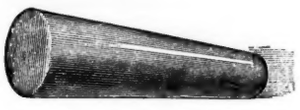
Ointments are sometimes mixed on glass plates, instead of in mortars, by means of horn or iron spatulæ. Some dispensers find this method more convenient than the other, but mixing in the mortar is the best, and also conformable to rule. [In making larger batches of ointments, it will be found most convenient to use a polished marble slab of considerable dimensions, say 18x24 inches, or 24x36 inches. —ED. AM. DR.]

Wax, tallow, oil of cocoa, spermaceti, and stearin, are to be added to ointments after being first made fluid by partial melting, but if wax or stearin be used, the mixture must be stirred until cool.

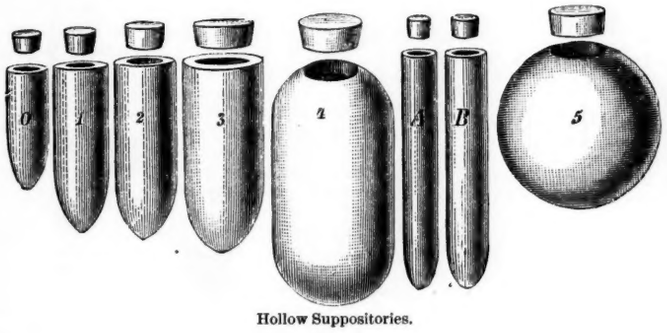
When several ointments are to be mixed, the more consistent must always be first triturated with a small portion of the softer.

Dry substances, or those that are insoluble in water or difficult of solution, such as *oxide of mercury, white precipitate, oxide of zinc, carbonate of lead, calomel*, as well as the alkaloids *quinine, morphine, veratrine*, and their salts, before being mixed with fat, must be prepared as finely as possible with a few drops of oil of almonds or some other bland fatty oil. If the quantity of insoluble substance, as for example, white lead or oxide of zinc, is too large to be triturated with a little oil, then, since the use of oil in large quantity would make the ointment too soft, a pestle and mortar are heated, and they are prepared with a small melted portion of the fat with which they are to be mixed, or they may be prepared with water, which by being mixed with the fat will become partially separated again, and may be poured off. This latter method of comminution, however, does not generally conduce to the good appearance of the ointment, or the separation of the water may not be complete.

In case *Opium* or EXTRACTS form constituents of the ointment, together with the above-named substances, oil should not be used, but rather water, with which a magma is made by triturating it together with the extract and the other substances, which magma is finally united with the fatty mass by trituration.



Suppository.



Hollow Suppositories.

Salts which are soluble in water may also be finely divided by means of water, yet not so finely as may be done by fatty oils. It is better to make eye-salves containing *corrosive sublimate*, sulphate of zinc, and nitrate of silver, with oil, since, if prepared with water, the latter evaporates and promotes the formation of little crystals of the salt. Salts which require hardly their own weight of water for solution, and especially those which deliquesce in the air, such as *chloride of zinc, chloride of calcium*, also *iodide of potassium, carbonate of potassium*, and *caustic potassa* should be rubbed as fine as possible, and, having been dissolved in the smallest practicable quantity of water, mixed with the fatty substance.

RECTAL AND VAGINAL SUPPOSITORIES.

SUPPOSITORIES, *suppositoria*, are smooth, blunt, conical bodies made of drugs, having a length of 1¼, 1½, or 2 inches, a diameter at the base of ⅝ to ½ inch, and a weight of 24 to 75 grains, [in this country, it has become customary to make them smaller; the U. S. Ph. directs them to be of about the weight of 1 gramme, or 16 grains] and intended to be introduced into the rectum. They should be of the consistence of a pill-mass, or a plaster which is not brittle, and also finished like a pill-mass, unless the prescription directs that they be cut out from a specified compact mass such as soap or cacao-butter. They are spread over with oil of almonds [not customary in this country], and dispensed in little glass pots or in waxed paper. Either butter of cacao or tallow is usually prescribed as the constituents of suppositories. [In this country, the fatty material is often left to the selection of the pharmacist, who generally uses cacao butter.] In these cases an addition of wax is always [by no means! ED. AM. DRUG.] necessary in order to obtain an appropriate mass and consistence. If vaseline is prescribed as a constituent, the addition of wax is likewise necessary. They are formed by mixing the drug with the melted oil of cacao, and pouring or dividing the mixture, half cooled, by stirring into corresponding conical paper capsules, which are supported in damp sand, or into regular suppository moulds. By proceeding in this manner, the thorough mixture of the drug with the oil of cacao will generally be doubtful, and on the other hand the proper dosing impossible. In order to meet both requirements of the prescription, there should be added to the cacao butter or tallow the sixth or eighth part of its weight of yellow or white wax (according to the color of the suppository), and these having been mixed by heating moderately, the drug is added, and the mixture allowed to become almost cold, being stirred meantime. The mass is then divided by weight, and each portion formed by the fingers into a suppository, which may be rendered smooth by stroking with a hot spatula.

℞ Acidi Tannici...gr. 15
Olei Theobromatis..... ℥ 1

M. Fiant suppositoria no. decem.

Here about 435 grains of cacao butter and 45 grains of white wax are to be melted in a porcelain mortar, and when half cold the tannin, rubbed to a fine powder, is added, and the mixture agitated until the mass can be kneaded with the fingers. Then it is divided into 10 parts of equal weight each.

℞ Opii pulveris.....gr. 1½.
Extracti Belladonnæ.....gr. 5.
Sebi taurini..... ℥ 1.
Misce ut fiant suppositoria 10.

In this case the opium and extract of belladonna are to be rubbed in a porcelain mortar, with 6 drops of water, to a thick mucilage, and this is to be intimately mixed with a small portion of a melted mixture of 405 grs. tallow and 75 grs. yellow wax. After the addition of the above ingredients to the half-cold fatty mixture, the mode of procedure is the same as that given in the foregoing example. The operation is much easier if the *opium* and *extractum belladonnæ siccum* in the form of fine powder are kneaded into the fatty mass.

The same procedure is also practicable without adding wax, but its use makes the fatty substance easier to knead with the fingers. Each suppository is to be rolled smooth with the blade of a plaster knife. [For further and more detailed information regarding suppositories, the reader is referred to Remington's Practice.]

VAGINAL SUPPOSITORIES are prepared in like manner as suppositories; only they are made as thick again (and, very frequently, globular). VAGINAL CAPSULES have lately come into use. These capsules are of the size of a pigeon's egg, but as to form and character they resemble gelatin capsules with lids. They are filled with the drug, closed by means of mucilage, and dispensed in boxes. Capsules

* The basis of this series of papers is the last edition of Hager's "Technik der Pharmaceutischen Receptur." The editors have, however, found it desirable to omit certain portions which relate to matters of practice peculiar to Germany and to insert others which are more characteristic of American customs. Editorial additions are inclosed in [ ].
The use of the original text has been kindly granted by Dr. Hager.

made from cacao butter, which are to be filled with a drug, can only be dispensed when the moulds for the manufacture of such capsules are at the command of the dispenser.

Should GUTTA-PERCHA be ordered as the constituent, it must be cut fine when hot, and powdered and mixed with the drug in a pill-mortar heated to 100° C., and the suppositories formed out of the soft mass while still hot.

HOLLOW SUPPOSITORIES, EMPTY SUPPOSITORIES. — American physicians some years ago introduced hollow suppositories, with stoppers, which are filled with the drug and closed, and then put into the rectum, the nose, etc. The convenience of their use is apparent. The mass from which they are made is cacao-butter.

The size 0 is for children, and can also be used for the ear and nose. No. 1, 2, and 3 are intended for the rectum. No. 3 and 4 may be used for the introduction of nourishment *per rectum*, and No. 4 may also be used for *vaginal* medication. No. 5 is a round, hollow suppository for the introduction of the medicines into the *vagina* and the *os uteri*, where it is kept in contact with the diseased parts by means of a tampon. A and B are used for any part of the *urethra*, the cavity of the uterus, and the nasal mucous membrane.*

BALLS.

BALLS, *globuli*, are [sometimes] ordered [by continental practitioners] to be used in baths. The drugs they contain are of various consistence. In case the prescription leaves the selection of constituents to the dispenser, he will use glycerin and powdered tragacanth only when caustic lime or sulphide of calcium do not enter into the composition of the balls. Otherwise they would be too hard.

℞ Ferri Sulphatis cryst..... 3
Potassii Iodidi..... 5
Sodii Chloridi..... 6½

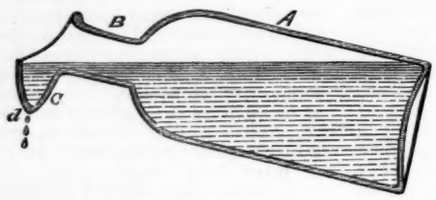
Misce. Fiant globuli quinque ad balneum.

An addition of about 150 grs. of powdered tragacanth, with the necessary quantity of *aqua glycerinata* is sufficient to produce a mass of the consistence of pills, which is to be formed into balls. If necessary, they are sprinkled with lycopodium.

Liquid drugs should be made into a mass with dry white clay (*argilla, bolus alba*).

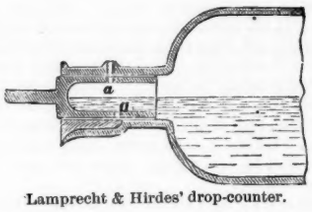
DROPPING.

The measuring of fluid drugs by means of dropping is an operation of very common use. The weight and size of the drop are dependent upon the size and thickness of the rim of the vial on which it gathers and from which it falls, and again upon the temperature and specific gravity of the fluid. But while the drop varies with the size and thickness of the rim, yet the specific gravity of the fluid bears no definite proportion to the size and weight of the drops. Hence a specific number of drops, and their common



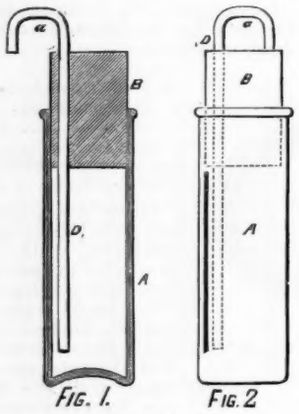
Putnam's drop-counter.

Pool's dropper.



Lamprecht & Hirdes' drop-counter.

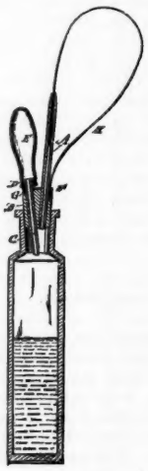
Drop-Pipette.



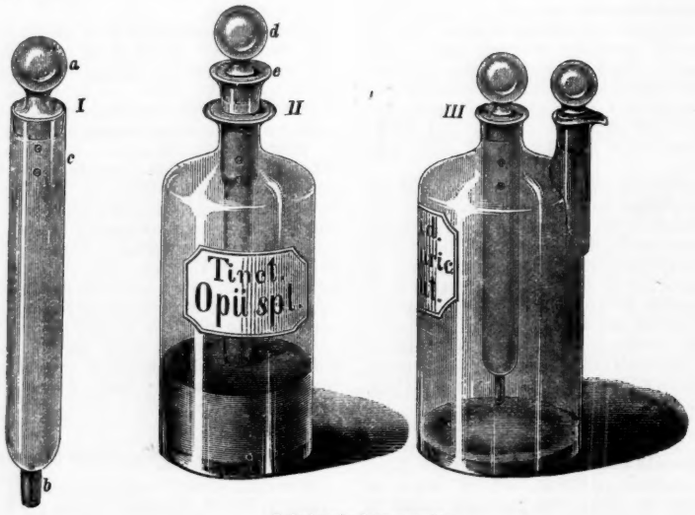
Dixon's drop-counter.

Fig. 1.

Fig. 2.
Drop-filter.


Bravais' drop-counter.

Salleron's drop-counter.



Lebaigue's drop-counter.

* These hollow suppositories were introduced to the trade by Hall & Ruckel, wholesale druggists, Nos. 218 and 220 Greenwich street, New York.

weight, relate only to the vessel from which the experimental dropping took place.

A DROP-COUNTER, called *compte-gouttes* by the French, was invented by Salleron.

This always delivers drops of the same size. It consists of a flask fitted with a lateral tube bent downwards, the lumen of which is of a fixed diameter, and which does not come to a point at the end from which the drops fall, but is cut off straight. The cut end (3.3 mm. in diameter), as well as the external end of the tube, is ground. The drops of fluid coming out of the narrow bore of the tube do not adhere to the cut surface nor rise above the sharp edge to the external surface.

Twenty drops of water from Salleron's drop-counter weigh 1.0 grammes (15.4, or, practically, 16 grains*).

[As Salleron's droppers, according to Hager's statement, are usually of bad construction, Pool's dropper might be used. This is primarily intended for stathmetic analysis (that is, gravimetric analysis in which the liquids to be tested and the test liquids are taken by weight). This is a flask with a bent neck arising from its lower part, and a small hole pierced through the neck, which is closed by one of the fingers when the flask is grasped. A stopper bearing a small thistle funnel, closed by a piece of sheet rubber, is inserted in its neck. When it is charged with the liquid to be dropped, it is taken in one hand, one finger being over the hole in the neck, and by gentle pressure upon the rubber cap, drops of the liquid are forced out.

A most convenient drop-counter for pharmacists' use is *Lebaigue's* (see Fig. I.). It consists of a glass tube in one piece, closed above and blown into a hollow ball (*a*), and at the bottom having a capillary exit tube, so that twenty drops flowing out from the latter weigh exactly 1.0 gramme (16 grains). Beneath the globular enlargement at the top, the glass tube is ground so that the drop-counter may be used to replace the glass stopper. Under the ground portion (at *c*) are two little openings for the entrance and exit of the air. This drop-counter is modified in cut II., by having the upper globular enlargement (*d*) in the form of a glass stopper, so that after it has been taken out of the vessel (at *e*) the fluid may also be poured out in small quantities. When from 6 to 30 grammes and upwards are to be weighed out, the entire drop measure is taken out. Still more convenient than this is the vessel represented in III., which has two openings, one for the simple drop-counter and the other for measuring out large portions of fluid.

While speaking of *dropping tubes*, it may be of interest to review the different kinds which we have described in previous volumes, or which have come under our special notice, outside of the ordinary medicine dropper or plain pipettes known to everybody.

A simple form of Drop-Pipette was described some seven years ago in the *British Journ. of Photography*. It consists of a narrow glass tube drawn out to a point, and inserted with its other end into a rubber tube which, when charged, is closed with a cork. By gentle pressure, the liquid may be delivered in drops. This may be used when the ordinary dropper with a closed small rubber bag or bulb is not accessible.

A drop-bottle devised by Emmel P. Putnam (U. S. Pat. No. 224,807, of Nov. 23d, 1880) has a conical recess at the neck, so arranged that it does not interfere with the insertion of the stopper. The recess or cup has a fine opening in the bottom or point, whence the liquid issues in drops.

Another somewhat more complicated arrangement is that devised by Raoul Bravais, of Paris (U. S. Pat. 236,538, of Jan. 11th, 1881), consisting of a bottle, in the stopper of which are inserted two tubes, *A* and *C*. *E* is a rubber-bulb, to compress the air inside of the bottle, so that the liquid may be forced out through *A* when the bottle is inclined. A flexible wire, *H*, is attached to the bottle, for clearing out the interior of the tube *A* when required. When the apparatus is not in use, the wire may be coiled about the neck of the bottle, or it may be kept inserted in the orifice of the tube *A*.

A drop-counter was patented in Germany, in 1884, by H. Lamprecht and G. Hirdes (Germ. Pat. 24,116). It has a hollow stopper, provided with a small aperture at the side which corresponds to a similar aperture in the neck of the bottle, for the purpose of admitting air. Along the opposite side of the stopper a narrow channel is ground, by which the liquid finds its exit.

A very simple dropper may be made as follows: Take a narrow glass-tube drawn out to a point and bent at a right angle. Insert the wide end into the bottle (which should be rather full of liquid) and incline the latter. The liquid will ascend the tube by capillary attraction, and will eventually drop from the pointed orifice. In the absence of a glass tube, a narrow strip of filter paper or other unglazed paper, bent at right angles, will serve to conduct the fluid, and will deliver it in drops. See cut to the left of "Drop-Pipette."

A dropper which is at the same time a drop-filter was proposed by a French pharmacist in 1877. It is simply a rubber bulb of an olive shape, containing a glass-tube at one end and a pellet of cotton in the bulb *C* of the tube. It may be attached to the neck of a bottle (Fig. 1) or to a filter tube (Fig. 2). When inverted over a bottle, gentle pressure with fingers will cause the liquid to drop.

The dropping-bottle invented by Franklin M. Dixon, of Philadelphia (U. S. Pat. 234,003, Nov. 2d, 1880), has parallel sides throughout, or in the neck only, within which is a long stopper, through which a bent glass-tube *a* passes. When the apparatus is not in use, the open, short end of the bent tube *a* is turned so that its orifice rests on the stopper. When it is to be used, the tube is turned, so that the open end looks outwards as in Fig. 1, and by pressure upon the stopper or plunger, the liquid is made to issue in a stream or in drops, as may be desired.]

The subject of measuring by dropping instead of by weight is passed over by the Pharmacopœia Germanica in absolute silence, although it cannot be ignored. The official Prussian Price Table of Medicines supplies this deficiency by the following directions:

The following are to be deemed equal to one (1.0) gramme [16 grains].
20 drops of fat and specially heavy ethereal oils and tinctures,
25 drops of other ethereal oils, chloroform, acetic ether,
50 drops of ether, alcoholic ethers, and aqueous liquids.

[To be continued.]

Volumetric Estimation of Sulphuric Acid in Sulphates.

H. WILSING proposes to accomplish this by precipitating the neutral solution of a sulphate with an excess of barium chloride, and determining the excess of the latter volumetrically by solution of carbonate of sodium, phenolphthalein being used as indicator. As soon as all the excess of barium chloride has become converted into barium carbonate, the first drop of volumetric solution of sodium carbonate added in excess reddens the phenolphthalein.

If the solution of the sulphate is neutral and contains no substances precipitated by solution of carbonate of sodium, the operation is very simple. 20 to 50 Cc. of the solution of the sulphate to be tested are put into a capsule, heated to boiling, and a 4-per-cent solution of barium chloride (the *exact* strength of which is kown) is added in excess. A few drops of solution of phenolphthalein are now added, and the boiling solution titrated with a 2-per-cent solution of sodium carbonate, until a red tint just makes its appearance.

If the original solution is acid, or if it contains substances capable of being precipitated by the carbonate of sodium, it is raised to boiling, treated with a few drops of phenolphthalein solution, and then with the solution of sodium carbonate, until it just begins to have a red tint. Now the chloride of barium solution is added, and the remainder of the operation carried out as in the former case.

If the solution is alkaline, it is first neutralized with hydrochloric acid.

Standardizing Volumetric Solution of Iodine.

IN preparing volumetric solution of iodine, it is customary to start from the resublimed iodine of commerce, by dissolving a known quantity of this in an aqueous solution of iodide of potassium. As the iodine thus used is required to be pure—though it is often used without previous qualitative examination, as we have had ample opportunity to observe—a source of error may be introduced through the fact that it is accompanied by impurities. And, besides, a solution of hyposulphite of sodium has to be adjusted of such a strength that it will exactly correspond with it; and this latter solution is itself to be used for assaying iodine solutions of known strength.

All these operations can, of course, be carried out with great accuracy, and careful analysts do not find them troublesome. Yet, in some cases, it may be of advantage to utilize a proposition made by Wilhelm Kalmann (in *Ber. d. Deutsch. Chem. Ges.*, 1886, 728) for determining the exact titer of the iodine solution by means of the decinormal solution of soda. It consists in this, that the iodine solution to be estimated is treated with hydrosulphuric acid, whereby the iodine is converted into hydriodic acid. The acid solution is then mixed with a little methyl-orange, which is unaffected by hydrosulphuric acid, and titrated with soda until a yellow tint appears.

[Any bromine or chlorine present in the iodine would, of course, be also converted into the corresponding acids, and the decinormal soda solution would probably show this by the anomalous quantity of it used.]

1 C.c. of decinormal soda solution corresponds to 0.0127 Gm. of iodine.

Artificial Plants for botanical instruction are a novelty, prepared by Christine Jauch, of Breslau, under the scientific control of B. Stein. These are complete plants, of the size of the original; stem, leaves, fruit, flower, etc., being exactly copied, and colored after nature. They are intended to fill a long-felt want, as the natural plants suitable for illustrating lectures cannot always be collected. A great advantage is this, that they represent every organ in its natural size. They are put up in a series of ten, four of these series being now completed. Among them are many important medicinal plants, such as Cinchona officinalis, Erythroxylon Coca, Colchicum autumnale, etc. Each series costs 22 marks (in Breslau), and may be had through any importing German bookseller.

* Hager says: "It is to be regretted that it is difficult to obtain a well-constructed Salleron's drop-counter in Germany.

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EDITORIAL.

WITH reference to the recent pharmacy law enacted in Wyoming, while we have no desire to set up our legal light against that of our Wyoming friends, we may remark that the insertion of the word "registered" in the portion of the act relating to the appointment of the members of the Board of Pharmacy appears to us as tantamount to putting the cart before the horse.

Up to the passage of this act, the Territory of Wyoming had no "registered pharmacists."

The present law establishes a commission which is to register pharmacists of certain qualifications without examination.

The Governor is to appoint three commissioners; but he must select them from among "the registered pharmacists."

The question arises, how can the Governor select any *registered* pharmacists for appointment when there are none as yet in existence, and when the act of registering *any one* can only be performed subsequent to the act of appointment by the Governor?

It is true that the qualifications of the first three commissioners are defined as follows: "all of whom shall have been residents of the Territory for two years, and of at least five years' practical experience in their profession." But nothing is said in the law about the manner in which these three commissioners themselves shall become "registered."

This is a common defect in many laws of this kind, and may sometimes lead to a practical annulment of a law. When a new body or commission is created who are to act as it were as judges or umpires over members of their own profession, it is always advisable to make a special provision in the law, by which the first appointed body may—through virtue of their appointment—enjoy all the rights and privileges of those whom they have to supervise.

WE wish that our readers may give some attention to the paper on page 126, relating to the advisability of establishing a Druggists' Exchange Bureau under the auspices of the N. Y. State Pharmaceutical Association, as an instance of "how not to do it" and as a model to be avoided. It is rather as an illustration of these points that we have given it place in our pages than on account of its value, in other respects. So far as it expresses the writer's *opinion*, the whole might have been condensed into one phrase, *viz.*, "*Don't;*" but if we understand the purpose of having a subject submitted as a query to be answered after deliberation, it may be expected, with some reason, that the reporter will state some, at least, of the facts upon which he bases his opinion.

If the reasons are so apparent to those who give a little thought to the subject, that nothing but the individual opinion is necessary, there is then no occasion for making it the matter for a special report. It is, however, quite evident that the writer of the report considers such a bureau to be within the province of the Association and that its establishment may be desirable, and one cannot fail to be somewhat curious to know the special reasons why the Association is not in as good a position to consider the matter now as it is likely to be in the future.

ANOTHER exception which we wish to take to the matter of the query is the implied dishonesty of the few persons at present engaged in negotiating transfers of business and property, of the kind referred to. To the best of our knowledge and belief, the charge is entirely groundless, and one proof of it is the report itself, for if there were good grounds for belief that the brokers at present conducting the business are not reliable persons to deal with, the occasion for mutual action on the part of the members of the Association is a matter which demands more consideration than the bare statement of one individual member, that, in his opinion, the time has not arrived for interference on the part of the Association.

OUR individual opinion coincides with that of the reporter, but we will go further to say that the reasons for our belief are: That the present agencies for negotiating transfers through brokers and drug-journals are so satisfactory and efficient that it would be a waste of energy for the Association to undertake a competition with them, unless it restricts the enjoyment of the services of such a bureau to its members and could make the privilege a valuable inducement towards the acquirement of membership.

THERE has been trouble in the Chicago College of Pharmacy, and some of the faculty have associated themselves with others to organize a new college, to be known as the Illinois College of Pharmacy, and located on the corner of Lake and Dearborn streets, in the building recently occupied by the Public Library.

We are not aware of the special occasion which required the duplication of the means of pharmaceutical instruction, but there is little doubt that both schools will find sufficient patronage and that both will be improved by healthy competition.

A TOUCH of æstheticism seems to have reached a recent medical writer who speaks of a "penile organ" instead of a penis, but remains silent about the "scrotal organ." This æstheticism so impressed us that we at once sat down on our anal organ, grasped our writing tool in our manual organ, stretched forth our brachial organ, and wrote the following protest which we at once took to the printers by setting in motion our pedal organs:

O ye editors of journals, medical and otherwise! Do not patiently submit to this subversion of the English language, and strangle this villanous mode of expression, should it ever again dare to appear in any manuscript submitted to you!

Charles Froebel, late Professor of Analytical Chemistry at the College of Pharmacy of the City of New York, died at New York, after a brief illness, on June 19th, 1886. He was the grand-nephew of Friedrich Froebel, founder of the Kindergarten system. His father, Julius Froebel, well known as an advanced thinker, journalist, traveller, and political economist, at present holds the position of German Consul at Algiers. Charles Froebel was born in Germany in 1836, and came to this country, with his father, in 1849. Having completed his elementary education, he went to Freiburg, where he studied natural history; subsequently, he continued his studies at Philadelphia under Prof. Ghent. At one time, he served in the United States Army, being mostly stationed on the plains, where he took advantage of the leisure and surroundings to continue studies in geology and allied branches of science. In 1873, he became Professor of Analytical Chemistry at the College of Pharmacy, and conducted the analytical laboratory up to within a few years ago. After his retirement from the faculty of the College, he undertook to establish a Bureau of Scientific Information, which unfortunately turned out to be a failure. Since then, he has been engaged in literary work, and was proposing a return to Europe when he was overtaken by an attack of erysipelas, which so exhausted him that he succumbed after a two weeks' illness. All who knew him admired him for his manly virtues, unflinching character, and superior attainments. He had a host of friends, and the news of his decease will sadly surprise many of his former pupils. May he rest in peace!

Medicated Cottons.

BESIDES the pure cotton-wool used in surgery, there is a considerable number of ingenious preparations in which the pure cotton is impregnated with a variety of medicinal substances, in order to render it a valuable agent in the dressing of wounds, in painful swelling or indurations, and for a number of external applications.

Purified Cotton-Wool.

Macerate the commercial article for the space of ten minutes in benzol, press out the liquid, and allow the cotton-wool to dry by exposure to the air. This treatment has for its object to remove any grease or resinous matters which may be present in the samples, and thereby enables them to absorb the medicating substances more easily. [This is *Gossypium* of the U. S. Ph.]

Iodized Cotton.

The iodized cotton of Méhu is prepared by thoroughly drying 375 grains of pure cotton-wool in a stove, then mixing with it 30 grains of iodine, and placing the mixture in a closed flask [or other vessel] at a temperature of 212° Fahr. for an hour, upon a water-bath. The iodine is thus equally diffused through the cotton. This preparation, it is said, acts as a useful revulsive in neuralgia, serous effusions, slight inflammation of the respiratory organs, etc. A modern French work gives the following instructions:

Iodine	1 part.
Purified Cotton-wool	12 parts.

Inclose the iodine in some filter paper and place it at the bottom of a flask with wide mouth; then introduce the cotton-wool and close the flask by covering the mouth. Place the flask in a moderately warm place until the cotton appears to be uniformly colored by the iodine. The preparation must be kept in stoppered bottles with wide mouths, placed in a cool place and out of the light.

Salicylated Cotton.

This preparation consists of purified cotton-wool impregnated with about 1-300th of its weight of salicylic acid. It has been found useful as an antiseptic agent in the dressing of wounds. In cases of amputation it is asserted that the patient has been kept without fever by the use of a salicylated cotton-wool dressing, which was only required to be renewed at the end of the week. The formula for its preparation is as follows:

Purified Cotton-wool	100 parts.
Salicylic Acid	10 "
Alcohol	100 "
Glycerin	1 part.

Dissolve the salicylic acid in the alcohol, add the glycerin to the solution, saturate the cotton-wool with the liquid, press out the superfluous liquid, dry with the usual precautions, and keep in wide-mouthed bottles.

Boracic Acid Cotton.

Purified Cotton-wool	q. s.
Boracic Acid	10 parts.
Water	90 "

Dissolve the boracic acid in the water at a temperature of 140° Fahr., saturate the purified cotton-wool with this solution, press it, dry it, and preserve it in corked bottles having a wide mouth. (See below.)

Iodoform Cotton.

This preparation has come somewhat extensively into use during the last five or six years. It is best made in the following manner:

Iodoform	2 parts.
Ether	10 "
Alcohol	10 "
Glycerin	10 "
Purified Cotton-wool	30 "

Dissolve the iodoform in the mixture of the ether and alcohol, add the glycerin to this solution, and saturate the cotton-wool with the liquid. Let it dry by exposure to the air. Draw the cotton out and keep it in glass-stoppered bottles with a wide mouth, closing well, and placed in a dark, cool place. (See below.)

Glycerinated Cotton.

This is a preparation recommended by Gubler. It consists simply of pure cotton-tissue moistened with pure glycerin; and it is said that cotton so prepared is permeable to all medicinal liquids without losing either its suppleness or its lightness. It is obtained by pouring a few drops of pure glycerin upon squares of cotton, and then squeezing them as strongly as possible with the hands.

Hæmostatic Cotton.

To prepare hæmostatic cotton, the purified cotton-wool is boiled in a solution of soda, and then plunged into a solution of perchloride of iron.

Ammoniacal Cotton.

This product was described a few years ago by Mr. B. Brown, who observed that when ammonia gas is passed through pure, dry cotton-wool, it is absorbed to a very large amount. In a water-bath, exposed to the air, the preparation loses all its ammonia. —After *Chem. and Drugg.*

NOTE OF ED. AM. DRUGG.—Some of the preceding formulæ omit to give directions how the final product may be made to contain a definite amount of the medicinal material. It is evident that, if absorbent cotton be dipped into a solution of boracic acid of known strength, and the cotton is afterwards pressed out, two or three operators using this process will each obtain a product containing a different percentage of boracic acid, simply because each will probably use a different amount of power in squeezing the cotton. If uniformely-charged borated cotton is wanted, a weighed quantity of the absorbent cotton must be made to soak up the whole of the definite (weighed or measured) quantity of solution of boracic acid of known strength. The cotton will then contain all the boracic acid that has been present in the solution, and it now remains only to drive off the water. Of course, we are aware of the difficulty of making the boracic acid, and similar substances, adhesive enough to prevent it from being dusted off the fibre when the cotton is handled. But this can be done.

Regarding iodoform cotton, this may be prepared in the same manner as the iodoform gauze, for which we gave a formula on page 177 of our last volume.

The Solubility of Sulphur in Alcohol.

THE fact that sulphur crystallizes from its solution in hot alcohol in a white prismatic form has not, it appears, been generally noticed in textbooks; for Miller's "Inorganic Chemistry" is the only book at my disposal in which I can find it mentioned. This is the more surprising as it has become of considerable importance since the introduction of rubber corks.

I discovered this fact for myself while separating some fat and sulphur with alcohol, being surprised at the deposition of white crystals from the hot solution.

By dissolving sulphur in hot methylated spirit, and allowing it to cool slowly in a vessel surrounded by hot water, prisms of lengths up to half an inch were obtained; they were brilliantly transparent and so white that they might have been taken for crystals of nitre; but they had become quite opaque and pale yellow in the course of thirty-six hours, although kept under the liquid; a low power of the microscope showed very beautifully the change into octahedra.

A more important bearing of the subject is in its relations to the use of rubber corks with alcohol. Mr. G. S. Johnson has called my attention to some crystals which he obtained in extracting a resinous body with alcohol, and which proved to be sulphur derived from the rubber cork connecting his flask and condenser. If a rubber cork be boiled with alcohol for fifteen minutes, a good crop of sulphur crystals is obtained on cooling the liquid. It is evident that if alcohol be constantly distilled on to a rubber cork the resulting error will be still greater.—ARTHUR G. BLOXAM in *Chem. News.*

Analysis of Koumiss.

FROM a paper by Dr. P. Vieth, F.C.S., in *The Analyst*, April, 1886, on "Milk and Milk Products," we select the following, referring to the composition of Koumiss (Kumys):

"In addition to the analyses of mares' milk Koumiss, which I brought before the Society a few months ago, I wish to give you the composition of Koumiss made of cow's milk, and sold under the mark of "full Koumiss." The proteids were determined separately, viz., casein, precipitated by lactic acid; albumin, coagulated by boiling the filtrate; and lacto-protein and peptone, precipitated by tannic acid in the second filtrate. Sugar was not determined, but taken by difference; carbonic acid was not taken in account.

Composition of Cow's Milk Koumiss.

Age.	Water.	Alcohol.	Solids.	Fat.	Casein.	Albumin.	Lacto-proteid and peptone.	Lactic acid.	Sugar.	Ash. Sol.	Ash. Insol.
1 day	88.50	.17	11.33	1.65	2.06	.30	.32	.26	6.16	.16	.42
1 week	90.15	.92	8.93	1.48	2.00	.22	.56	.97	3.14	.23	.34
3 weeks	90.31	1.03	8.66	1.58	1.98	.21	.74	1.89	2.23	.23	.35
3 months	90.36	1.12	8.59	1.57	1.70	.09	.91	1.94	1.73	.25	.33

The composition of Koumiss of different ages clearly shows the progress of lactic and alcoholic fermentation and of the accompanying process of peptonization, the former by the decrease of sugar and the increase of lactic acid and alcohol, the latter by the decrease of casein and albumin and the increase of compound precipitable by tannin. Of further interest is the increase of the soluble and the decrease of the insoluble part of the ash, which, in my opinion, is due to two causes, viz., the increasing amount of lactic acid and the transformation of casein, with which the phosphates in milk are chemically combined.

Administration of Terebene.

THE following formulæ for preparations of terebene are taken from the *Colonial Druggist* (reprinted in *Nat. Drugg.*), and will be found convenient to druggists, for they are usually applied to by the physicians for the proper combinations to administer new remedies:

Terebene is employed as a remedial agent, not only in cases of "winter cough," phthisis, dyspepsia, etc., as related by Dr. Murrell, but also in various affections of the alimentary canal, in certain skin diseases, and as a disinfectant; this has naturally created a considerable demand for this preparation.

The ordinary mode of taking terebene —"10 drops upon a lump of sugar"— has several disadvantages, not the least of which is that the sugar, if thoroughly impregnated with the hydrocarbon, is rendered—for some time at least—practically insoluble in water or saliva; it has, therefore, either to be crushed by the teeth and well masticated, or else retained in the mouth for an inconveniently long period. The linctus given below will be found far more convenient, as well as more palatable:

Take of
- Terebene.....5 fl. drs.
- Powdered Gum Arabic...4 fl. drs.
- Syrup of Tolu.....1 fl. oz.
- Strained Honey.....2 fl. oz.
- Tincture of Saffron.....q. s.
- Water.....q. s.

Mix intimately in a small mortar the terebene and the powdered gum; emulsify carefully with 1½ ounces of the water, adding the syrup of tolu gradually toward the last. Stir in the honey until the whole has become smooth; make up to the measure of 6 fluidounces, and color with a few drops of the tincture of saffron. The dose is one teaspoonful. This linctus keeps well, and is generally appreciated, even by young children, while in a variety of throat affections it gives speedy relief, although free from narcotics; observations which also apply to

TEREBENE COUGH MIXTURE.

Take of
- Terebene.....1 fl. oz,
- Powered Gum Arabic...4 drs.
- Powdered Sugar.....3 troy oz.
- Yolk of Eggs.....2
- Anise Water.....2 fl. oz.
- Camphor Water.....4 fl. drs.
- Distilled Water.....q. s.

Mix the two powders in a mortar, and stir in the terebene. Emulsify with the yolk of egg, and the aniseed and camphor waters previously well beat up together. When perfectly smooth, make up with water to the measure of eight fluidounces. Dose: One teaspoonful as often as may be necessary. An acidulous modification is as follows:

Take of
- Terebene.....1 fl. oz.
- Powdered Gum Arabic..30 grs.
- Powdered Sugar.....1 troy oz.
- Yolk of Eggs.....2.
- Syrup of Lemon.....3 fl. oz.
- Water.....q. s.

Proceed as previously directed, only emulsify with a very little plain water, before adding successively the yolk of eggs and acid lemon syrup. If the eggs be not "new laid," it may be as well to beat up the yolks with about twenty or thirty minims of diluted phosphoric acid before stirring the same into the other ingredients, as before. Make up to eight ounces. Both this and the preceding mixture may be tinted, if desired, with a little saffron or caramel.

This mixture should contain about sixteen grains of citric acid to the fluidounce; therefore, if the lemon syrup used is not strong enough in this respect, a little powdered citric acid must be added to make up the deficiency.

PASTILLES OF TEREBENE.

Take of
- Terebene.....80 to 100 Gm.
- Gum Arabic.....400 Gm.
- Powered Tragacanth....200 Gm.
- Powdered Loaf Sugar....500 Gm.
- Glycerin..... 30 Gm.
- Oil of Lemon..... 12 Gm.
- Eggs (white of).....5 or 6.

Dissolve the oil of lemon in the terebene, and add the mixture to all the powdered gums and 100 grammes of the sugar. When thoroughly incorporated, emulsify with the smallest convenient quantity of water, and add the glycerin and the egg albumen, the latter having been well whisked. Transfer to porcelain or enamelled iron vessel heated by a water-bath, and, when warm, slowly sift in the fine sugar as it dissolves in the viscous fluid. Stir constantly, and evaporate until a little dropped upon a cold plate becomes, after ten minutes, of a sufficiently firm consistence. Pour out to the depth of about half an inch upon cold tin or porcelain plates, which have first been dusted over with finely-sifted dry starch. When cool, divide the stiff, dough-like mass into squares or diamonds of suitable dimensions, using a mixture of one part white sugar and three parts starch, perfectly dry and in fine powder, to prevent sticking. A small sugar-sifter, or "dredger," will be needed during this operation. These pastilles may be safely given to the youngest children, and for persons of old age are very efficacious in dislodging both phlegm and flatus.

AROMATIC TEREBENE FOR DISINFECTION.

Take of
- Terebene ..... 2 oz.
- Eucalyptol..... 3 drs.
- Thymol.....20 min.

Mix.

Put up in "sprinkler" bottle, and impregnate small pads of cotton, wool, bran, "wads" of lint, blotting paper, etc., and hang them about the apartment some two and a half to three feet from the ground, especially in such situations where a draught from door or window is likely to cause currents of air to pass over them occasionally.

AROMATIC TEREBENE SPRAY.

The disinfecting mixture just mentioned, either by itself, or, preferably, dissolved in an equal bulk of strong alcohol, or Larbalestier's eau de cologne, is shaken up in an atomizer with ten parts of plain water. When "sprayed," a refreshing fragrance is imparted to the air, and septic fermentation cannot take place therein.

Reaction of Quinine and Quinidine with Chlorine or Bromine.

IN connection with the paper on page 124, Dr. Weller gives some interesting details on the action of chlorine and bromine upon quinine and quinidine.

When chlorine water is added to the hydrobromide of quinine or of quinidine, the solutions will usually acquire a more or less intense red color. This color belongs to the same class as the well-known thalleioquine and other similar colors, and has been repeatedly noticed before, but no practical use appears to have been made of the fact.

Since bromine acts more promptly than chlorine, it is best to examine first the behavior of the two alkaloids towards bromine water. On adding a few drops of the latter to a neutral and highly concentrated solution of hydrochlorate of quinine or quinidine, which had best still contain some undissolved salt, there is at first produced a yellow precipitate which rapidly disappears. After a short time, however, the liquid acquires a rose tint, which becomes gradually more intense, and finally has a magnificent cherry-red color. This color is not lasting, but disappears after a while, but a fresh addition of bromine water will easily reproduce it. The reaction succeeds still better if the solutions are slightly warmed before the bromine is added. In this case the color appears instantly when bromine water is dropped in. In dilute solutions, the reaction appears likewise, but much less prompt or intense, though even here it is hastened by warming.

Dr. Weller points out that this reaction is by no means as searching and delicate as the thalleioquine or Vogel's reaction, and that it will, therefore, not displace the latter. In presence of acids, the red color does not appear at all; the same happens if too much bromine water is added. This produces a copious, golden-yellow precipitate, which consists very probably of brominated substitution-products.

The same phenomena are observed, though not so promptly, when treating the free alkaloids, quinine and quinidine, in this manner.

The *commercial* salts of cinchonine and cinchonidine likewise give the reaction more or less intensely. But Dr. Weller could not produce it with the chemically pure salts.

Chlorine water produces the same result as bromine water, but less promptly or intensely. On the other hand, if added in excess, it does not produce a precipitate. Strong mineral acids prevent the reaction, but acetic or tartaric acids alter the red color only slightly. An excess of chlorine discolors the red solution, hence it must be added cautiously.

Solutions of quinine and quinidine which have been turned red by chlorine water show a peculiar behavior towards ammonia. If the red color had been produced by a very small quantity—2 or 3 drops—of chlorine water, ammonia produces in this solution a light rose-tinted precipitate, which retains its tint a long time, and, when warmed, runs together to a more intensely red-colored, resinous mass. On the other hand, if the color had been produced by the addition of a larger quantity of chlorine water, the rose-red precipitate is here first produced by ammonia likewise, but it soon turns green, and so does the liquid it is suspended in; in other words, the thalleioquine reaction takes place. As the amount of chlorine water is increased, the rose tint becomes less perceptible, and the green color appears the more rapidly.

If bromine water be substituted for chlorine water, the addition of ammonia likewise produces a rose tint, but it passes very rapidly over into green, even though but 1 or 2 drops of bromine water have been used.—Abstract from *Arch. d. Pharm.*, 224, 163.

The Chilian Pharmacopœia. — A Chilian pharmacist, now attending the lectures quite regularly at the Paris School of Pharmacy, has charge of the publication of a national pharmacopœia for Chili. The original intention was to have the work done in Paris, but the demands of Parisian printers proved so exorbitant that the job was given to a firm in Leipzig, Germany, whence the proof-sheets are sent here to be read, and returned after revision. —*Chem. and Drugg.*

To Disguise the Taste of Quinine Dr. Hugo Engel recommends a mixture with one grain of quinine, of one grain of chloride of ammonium, and four grains of powdered licorice root. The same proportion of chloride of ammonium must be used for larger doses, but ten grains of the licorice will suffice for ten grains of quinine.

ON A NEW THERMOREGULATOR WITH ELECTRIC ATTACHMENT.

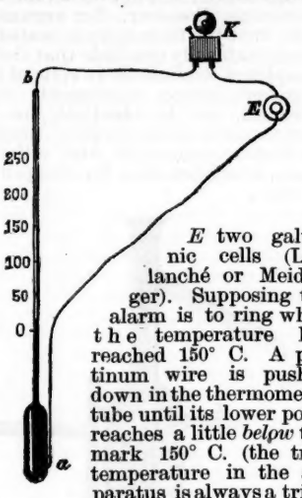
Most of the automatic thermoregulators heretofore proposed were constructed in such a manner that the supply of gas to the burner was regulated, or entirely shut off, by the expansion of a certain volume of mercury contained in a reservoir directly affected by the temperature of the apparatus to be heated.

It has been observed by Alexander Kaleczinsky that, when such a construction is used, the mercury in the reservoir is gradually volatilized and deposited as a more or less dense metallic layer in other portions of the glass portion of the apparatus, as well as throughout the india-rubber tube carrying the gas, and that it even reaches the burner, where it has been found (in the colder portions) in globules visible with the naked eye. It is evident, therefore, that a notable quantity of it must reach the flame of the burner, and thereby become volatilized in the room where the operation is going on, endangering the health of the operators.

Now it would be difficult to find a more suitable liquid than mercury, for regulating the supply of gas. The error in the previously constructed forms was this, that the reservoir of mercury was included in the heating apparatus itself, whereby the whole column of mercury acquired a high temperature, and became prone to volatilize. In the improved apparatus here described, the reservoir of mercury is outside of the apparatus, and the rise and fall of the mercury brought about by the expansion of air confined in the glass-bulb *A* inside of the apparatus. This bulb is connected by a very stout rubber-tube (of small bore) with the branch tube *e* of the regulator proper. Supposing the gas under the heating apparatus is lit, and the tube *a*, through which the gas reaches the burner, is pushed down to within a short distance of the surface of the column of mercury. As long as the faucet *d* is open, any expanded air, within the bulb *A*, will have a chance to escape, and the level of the column of mercury will not be affected. When *d* is shut, however, the expanded air will depress the mercury in *c*, causing it to rise in the inner funnel-shaped tube, and, when it has reached the orifice of the tube *a*, it will arrest the passage of the gas, permitting only a very small amount to reach the burner through the orifice *x*, so that the flame will not go out entirely. The temperature of the apparatus can be regulated to within one degree centigrade by the height to which the tube *a* is raised or lowered; and this height will remain uniform for this temperature at any subsequent time. [It will be convenient to graduate the tube *a*, so that it may be drawn up or pushed down to any one of the graduated divisions, each of which has been previously determined, by experiment, to correspond to a certain degree of temperature.]

Another form of thermoregulator, which may easily be constructed of ordinary laboratory glass-ware, is shown in Fig. 2. It is intelligible without further description, by comparing Fig. 1.

In connection with this apparatus is shown an electric apparatus of general applicability. To construct it, take a thermometer tube with bulb, into which a platinum wire is fused, and which is open above. Introduce a sufficient quantity of mercury, and graduate the tube into degrees ascertained by comparing with a standard thermometer [at a known pressure of air]. *K* represents an electric bell, and



E two galvanic cells (Leclanché or Meidinger). Supposing the alarm is to ring when the temperature has reached 150° C. A platinum wire is pushed down in the thermometer tube until its lower point reaches a little *below* the mark 150° C. (the true temperature in the apparatus is always a trifle higher than that indicated by the thermometer, since it requires a notable interval for the mercury to expand in proportion to the temperature), and when the mercury rises so as to come into contact with the end of the wire, the current is closed, and the alarm bell rings. Of course, the alarm may be set for any temperature within the range of the heating apparatus.

It is best to surround both the open as well as the the standard thermometer with thin copper foil, in order to distribute the heat more uniformly and rapidly.—After *Zeitsch. f. Anal. Chem.*, 1886, 190.

Fig. 1.

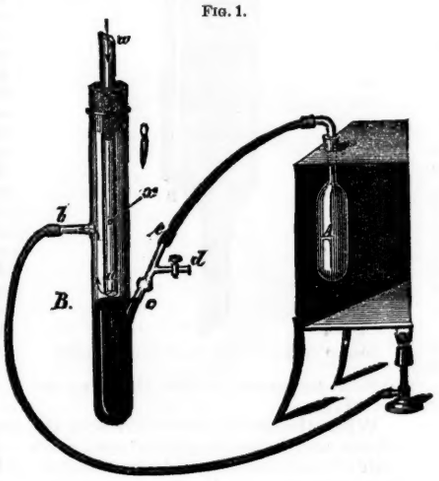
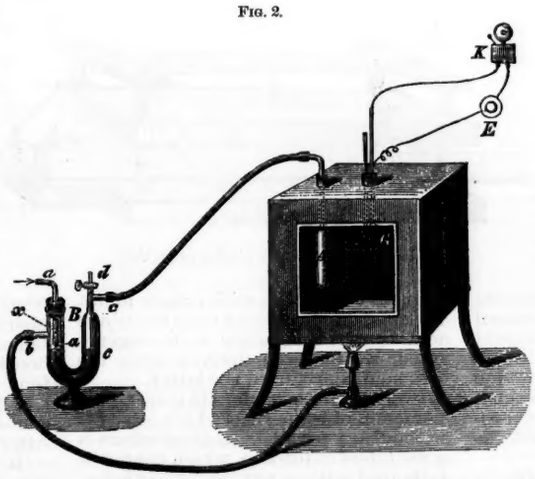


Fig. 2.



Indicator for the Volumetric Estimation of Phosphoric Acid.

The estimation of phosphoric acid, by means of soluble salts of uranium, requires that, when the reaction is supposed to be near the neutralizing point, sample-drops be removed from the liquid after every fresh addition of the reagents, in order to ascertain the moment when the uranium salt is present in excess. It is usual to ascertain this point by testing the sample-drops with ferrocyanide of potassium, which will produce a reddish-brown tint. It is a common occurence that the exact point is overshot by the operator, and that the assay will have to be repeated in order to hit the right point.

This drawback is now promised to be set aside by a discovery made by Ordinsky, who ascertained that, when a solution of the coloring matter of cochineal is added to acetate of uranium, in presence of acetic acid, a characteristic *green color* is produced.

Consequently, if tincture of cochineal is added to the liquid in which the phosphoric acid is to be assayed, the first drop in excess of the uranium solution should produce the above mentioned tint.—*Bull. Soc. Chim.*, 45, 246.

[We said "should produce," instead of "will produce," because we have not tried the method ourselves as yet, but shall have occasion to do so shortly.—Ed. Am. Dr.]

Liquor Morphinæ Bimeconatis.

Though the bimeconate of morphine is not often used in this country, yet it is occasionally prescribed, and the following note (from the *Chem. and Drugg.*) will be found of practical interest:

As prepared by Squire, the originator, and by others, this solution was of a cherry-brown color. The official solution, however, is colorless, or nearly so. In the official instructions for preparing this solution, no mention is made of filtration, and as filtration will often be necessary, it may not be amiss to draw attention to the fact that filter paper containing a trace of iron is totally unfit for this solution, iron being a common impurity of filter paper of commerce. *It is necessary*, before using an unknown sample of paper, to *test it for iron.* The usual delicate tests for ferric iron, ferrocyanide and sulphocyanide of potassium, are highly sensitive in this case. It is only necessary to place a drop of a dilute solution of either reagent on the suspected filter paper, and then moisten with any of the dilute mineral acids, when a blue or red spot, as the case may be, will indicate the presence of iron. Filter paper containing this impurity may be freed from it by washing with dilute nitrohydrochloric acid, and rinsing thoroughly with distilled water.

Tar as a Coating for Floors has been tried in Austrian military barracks, and has proven so valuable as a means for preventing accumulation of dust in cracks, and improving in other ways the sanitary condition of the rooms, that its application is being greatly extended. It requires renewal but once a year, and is very inexpensive. Its sombre color is its only disadvantage.

APPARATUS FOR FRACTIONAL DISTILLATION.

When it is desired to separate a liquid in several fractions, and to cause those having a higher boiling point to return into the flask, the apparatus shown in the cut, designed by Dr. Rud. Rempel, may be used. The vapor of the boiling liquid is forced to pass through the tube *A* containing glass pearls, while a suitable liquid, circulating in the outer tube *B*, causes a portion of the vapor to be condensed and to be returned to the flask. By regulating the temperature of the circulating liquid, it is easy to select any special fraction of the vapors that come over.

The apparatus is especially suitable for liquids which boil below 100° C. (212° F.), because in this case it is possible to feed the tube *B* with the water which has first circulated in the regular condenser, by which the escaping vapors are finally condensed, but which is not shown in the cut.

For liquids boiling above 100° C. (212° F.), it is necessary to cause glycerin, fusel oil, paraffin oil, or other suitable liquids to circulate in *B*.

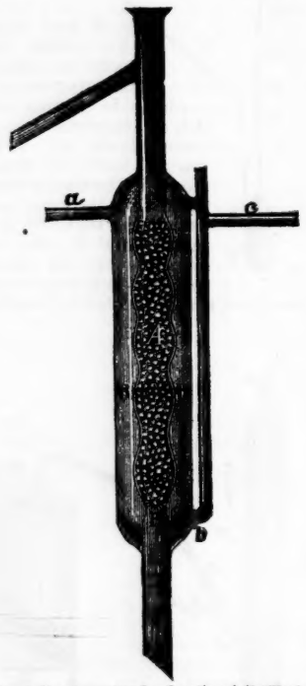
The size of the glass pearls is of some importance. In the case of low boiling liquids they should be about 4 to 5 millimeters (ab. ¼ inch) in diameter; in the case of higher boiling and heavier liquids, about 6 to 7 millimeters (ab. ¼ inch).—After *Chem. Zeit.*

On the Supposed Identity of Organic Substances of Identical Composition and Properties.*

Prof. Victor Meyer, who has for some time been engaged, in conjunction with his pupils, in the study of the thiophene group, which was first discovered by him and has, up to the present time, furnished some exceedingly interesting substances, has made a new discovery, which is evidently very important, but which can, for the present, only be recorded as a fact, since no explanation can be given on the basis of our previous knowledge.

The substance thiophen, which forms the subject of the author's studies, is indeed not likely to be of any immediate practical value to our readers. Yet it is upon derivatives of this substance that the new facts were observed. Among these there are two acids, called by the discoverer, respectively, *alpha*-thiophenic acid and *beta*-thiophenic acid, which are isomeric, but have very characteristic and decided differences, as has been shown by the results of experiments formerly made and published. At that time it was also shown that all derivatives prepared from either acid were absolutely identical. That is to say, that if both acids were subjected to the same treatment, the resulting products appeared to be in each case *absolutely identical*, in respect to all physical properties. Consequently, it should have been expected that if such a pair of identical products were subjected to further treatment by the same method, the identity of the subsequent products would continue. But this was found not to be the case.

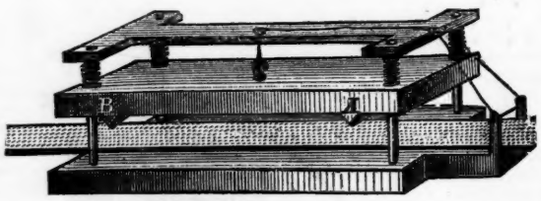
To illustrate the peculiar point in question by a homely example, let us for a moment suppose that we had obtained oxalic acid by oxidizing separate portions of cane-sugar and of milk-sugar, and that we were convinced of the identity of the oxalic acid obtained in either case from its responding to all the physical and chemical tests characteristic of it. Now, supposing we were to apply to both of these samples one and the same chemical process, we would expect that we should obtain identical results in each case. Would we not be surprised if we were to find that the sample of oxalic acid which had been obtained from cane-sugar had thereby been reconverted into *cane-sugar*, while the other sample had been converted, by precisely the same process, into *milk-sugar*? Of course, this example is based only on a supposition, and not on actual facts. Assuming, however, for argument's sake, that the facts were as stated, we would naturally conclude that the two samples of oxalic acid, in spite of their apparent perfect agreement, could, after all, not be identical, but that there must be some peculiar property or feature connected with either of them, which had thus far escaped our notice.



Rempel's apparatus for fractional distillation.

Now to return to the tiophene derivatives.

When the several derivatives of the *alpha*- and *beta*- thiophenic acid, each pair of which appeared to be absolutely identical under the most critical research, were boiled with caustic alkali, the compounds derived from the *alpha* acid caused this latter to be regenerated, while those derived from the *beta* acid reproduced the latter.



Dafert's apparatus for closing gas-tubing.

Prof. Meyer considers this as a phenomenon of isomerism which is, so far without any parallel. He thinks there is some *latent* difference, which cannot be fathomed with our present knowledge.

While we are not aware that such a remarkable observation has ever been made before or recorded regarding the chemical reconstruction of different substances from apparently one and the same body, yet there are some analogous examples available which show that apparent chemical identity is not always absolute identity. It is known by experience that those organic compounds which deflect polarized light and which are obtained from the plants themselves are devoid of the property of deflecting polarized light when they are prepared artificially (see Am. Drug., 1885, 71).* The cause of this is probably that during the synthesis or artificial preparation there are produced two optically-opposed, but otherwise isomeric substances; the optical power of one is neutralized by that of the other.

Now it may possibly be in this very direction, namely, the optical behavior, that those thiophene derivatives exhibited differences. Prof. Meyer does not state whether he examined them optically. Yet, even if they were to show a difference under the polarizing prism, this would not yet give us any explanation of the *cause* of the difference, but merely of the *fact*.

Certainly, the facts recorded by Prof. Meyer are very remarkable and excite curiosity.

AUTOMATIC CLOSURE OF GAS-TUBING.

When Bunsen burners [or gas-stoves] are made to burn a long time with a small flame—which is often necessary when thermoregulators are used—the flame will frequently strike back and may eventually set the rubber gas-tube on fire and thereby start a more or less serious conflagration. This is sometimes guarded against by laying a portion of the gas-tube into water so that it may not be able to burn. But this does not prevent the escape of gas, which will then be still turned on. Dr. F. W. Dafert now recommends a contrivance which will serve both purposes. It is constructed on the principle of the mouse-trap. The apparatus through which the rubber tube is made to pass is kept open by means of a spring held up by threads, the extension of which is laid alongside of the gas-tube. When the flame strikes back, and the end of the rubber-tube attached to the burner ignites, the threads take fire, the springs of the apparatus are thereby released, and the upper section of the apparatus, having two wedge-shaped, transverse, projecting bars at the lower surface, will be forced down upon the rubber-tube, which will thereby become permanently closed.—*Chem. Zeit.*

Limit of the Sense of Smell.

It has been demonstrated that the eye is capable of recognizing as minute a quantity as the one-fourteen millionth part of a milligramme, that is, the eight hundred and ninety-sixth millionth part of a grain ($\frac{1}{89600000}$) of sodium by means of the spectroscope. Recent experiments made by Prof. Penzoldt and E. Fischer, however, show that the sense of smell surpasses the limit of that of sight. Heretofore it had been demonstrated that of bisulphide of carbon, $\frac{1}{5000}$ of a milligramme could still be detected by the smell, of oil of rose $\frac{1}{20000}$ of a milligramme, etc. The above-mentioned authors have recently experimented with chlorophenol and mercaptan, and have found that of the former the six millionth ($\frac{1}{6000000}$), and of the latter the four hundred and sixty millionth ($\frac{1}{460000000}$) part of a milligramme could still be detected by the smell.—After *Med.-Chir. Rundsch.*

[It has already been suggested that some of these substances be used for testing the tightness of sewers, plumbers' work, etc.—Ed. Am. Dr.]

Removing the Odor of Benzin.—According to the *Scientific American*, the odor of benzin can be removed [rendered less objectionable?] by adding to it oxide of lead in solution of caustic soda, shaking and filtering.

* Based on *Ber. d. Deutsch. Chem. Ges.*, 1886, 628.

* Where the name of the author in the foot-note should, of course, read Z. D. Skraup, instead of Skroupt, which is the printer's blunder.

PACKING-CASE OPENER.

We find in one of our English exchanges a description of a tool which would be of great convenience in the store-room of a pharmacist. We are not aware that it is to be had ready-made in this country, but it can readily be constructed by any competent blacksmith.

It is intended for opening packing-cases and boxes and drawing nails, by which the destructive operations of the mallet and chisel or wedges and bars, usually employed, may be avoided, and quicker and better work done. It is (as the illustrations show) most simple in construction. The square piece of metal projecting over the joint or pin enables the tool to be used as a hammer. The jaws, it will be seen, are of unequal length, the smaller one dropping into a slot in the larger. The front then forms a forked or double-toothed wedge, which can be driven in between the boards to be separated, or under a nail-head. By pressing the ends of the arms together, power is applied to open the jaws, and thus to raise the lid or to pull the nail upwards. As the faces of the jaws press flatly upon the wood, and not upon the edges, the damage generally done to a case in this way is avoided.

Menthol.

Under the name of peppermint stearescence, stearoptene of peppermint, and peppermint camphor, menthol has been known and described since the latter part of the previous century, and tradition has it that the Chinese and Japanese have known this substance for centuries; I am informed by a Japanese gentleman, Mr. Moriyuma, that menthol is mentioned by Japanese historians as being in use, as a favorite and universal domestic remedy, at least two centuries B.C. Suffice it to say, however, that the earliest recorded investigations upon the composition of this substance were made upon menthol obtained from American oil of peppermint.

The invasion of cholera into North Europe, and the enormous consumption of oil peppermint in consequence, resulted in a considerable importation of the American oil peppermint; this American oil, from Mentha piperita, possesses the property of congealing at a temperature in the neighborhood of zero, and thus furnished the prismatic crystals of peppermint camphor. It was to these crystals, isolated in this manner, and obtained from American oleum Menthæ piperitæ, that Dumas turned his attention, and in 1832 the results of his investigations were made known: he determined the composition, fusing point, boiling point, described its properties and some of its transposition products.

Dumas was closely followed by Blanchett and Sell, Walter and Kane, who verified the formula advanced by Dumas and agreed with him in all respects, except the fusing and boiling points, in which latter respects they were widely divergent.

In 1861 and 1862, the camphor of peppermint, known as constituting the stearoptene of the essential oil of Mentha piperita, was then obtainable in large quantities; it arrived from Japan in coarse earthenware jars, simply protected by paper covers, and consisted of a mass of small, white, fragrant prismatic crystals resembling magnesic sulphate, with which salt it was then said to have been adulterated.

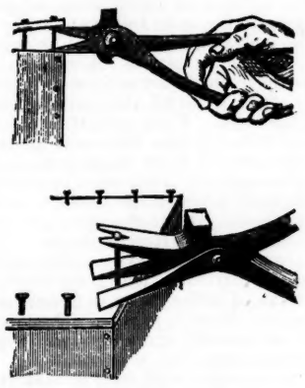
Gorup-Besanez and Oppenheim now gave this substance more extended examination than had heretofore been made; they verified the formula established by Dumas, which had previously been verified by Walter in 1830, and Oppenheim after elaborate research proved this peppermint camphor to be a monatomic alcohol, and proposed the name mentholic alcohol or menthol be substituted for that of peppermint camphor.

Though it appears to have been an article of commercial importance at this date, its uses were slight and the demand was light.

Various travellers in China and Japan have made mention of the use, by the natives, of a semisolid or viscous liquid peppermint for neuralgic troubles, and samples of solid or liquid oil were brought home as curiosities, and exhibited as Chinese or Japanese headache cure.

This cure was generally met with in long, heavy, flat glass vials and was a dark green or amber-colored fluid, quite viscous at ordinary temperatures, often, however, a moist crystalline mass. In 1871, this remedy was brought into more prominent use and notice, through its use by the Chinese of San Francisco, and was made the subject of an investigation by Flückiger in the same year.

In 1874, there appeared in the market at London a consignment of both the solid and liquid oil from Japan, and Mr. John Moss made an examination of the same, closely followed by Mackay, and later Becket and Wright. During 1876 at the Centennial Exhibition a beautiful exhibit of menthol crystals was made by Sachsse & Co., of Leipsic. Since this year menthol has steadily gained in importance.



Packing-case opener.

In 1879, Christy, of London, forwarded to Parke, Davis & Co. an important consignment of menthol, soon followed by other shipments. Early in 1880, Fritzche Bros., of New York, received a large consignment of menthol, and as this product rapidly gained in popularity, their shipments received were enormous, they controlling in fact the bulk of the article entering this country, as does Christy in England, to whom is said to be due the honor of introducing the menthol cone.

In 1881 Dundas Dick introduced the now famous cone to successful use in this country, being rapidly followed in this venture by Parke, Davis & Co., F. Stearns & Co., and Jno. Wyeth, until to-day there may be found in the market some thirty makes of cones of divers grades of purity; the pioneers having, however, faithfully guarded the purity of their goods.

The bulk of the menthol of commerce is consumed in the manufacture of cones, these cones being largely adulterated with such substances as paraffin, salicin, sugar, glucose, stearic acid, and white wax; the average of adulterant is 10%, the goods of reliable houses being as a rule pure and of good quality.—From a communication by Chas. L. Coffin, of Detroit, Mich.

Shellac.*

In the central provinces of India, especially in the thick jungles, the coccus lacca insects may be seen dwelling together in thick-set groups on the branches and twigs of *Zizyphus Jujuba*, *Ficus religiosa*, *Butea frondosa*, besides other trees and shrubs belonging chiefly to the Leguminoseæ order. Each insect incrusts itself over with a resinous substance, forming within a cell containing larvæ and a deep coloring matter, the dead body of the parent being itself the cell. Hundreds of these are piled together, adhering to a twig, and in this condition it is termed stick-lac, and contains about 70 per cent of resin, 10 per cent of coloring matter, and the rest débris.

The collecting of stick-lac and the making of shellac, button-lac, sheet-lac, and lac dye is an industry carried on by the Hindoos in the districts of the central provinces. In order to obtain the largest quantity, both of resin and coloring matter, the stick-lac is collected before the larvæ emerge from the cells, else with their flight they carry away the greatest part of the dye coloring.

Since the advent of the aniline dyes, lac dye is but little in demand. The larvæ are allowed to mature, as they do not interfere with the quality or quantity of the resin portion. It is chiefly this circumstance that keeps down the price of shellac, there being, consequently, more insect workers than formerly.

The process of dealing with stick-lac for the making of shellac and lac dye was witnessed by the writer when in India, and is as follows: The first part of the process is to separate the lac from the twigs. This is done by two women—one turning and the other feeding a primitive-shaped wooden mill. When a heap is formed (about a bushel in quantity), it is winnowed in a rustic-looking winnower, the lighter débris separating; the remainder is then hand-picked. The process of grinding and winnowing is repeated until the whole is reduced to small, orange-colored nodules. When in this condition it is termed seed-lac; the bright garnet-colored pieces, being few in number, are now picked out and set aside for native ornaments. The seed-lac is then placed in a large earthenware pan, and with it some water. A woman steps into the pan, steadying herself against the mud-wall with her hands, then turning violently to the right and left, in order to keep the lac in a continual state of motion against her feet and the sides of the pan for some time, the other woman occasionally adding more water until the vessel is full of a dark-colored liquid. After settlement, the dye water is removed into another earthenware pan, and the lac again washed until the water runs away clear.

Lac Dye.—The treatment of the colored water for the purpose of obtaining from it the lac dye is very simple. After straining, lime-water is added, which precipitates the dye. The water is then drained off, and the dye drained through cotton cloth; from this it is transferred to compressible frames, containing strong iron plates, and reduced by a native screw-press to solid sheets of dark purple dye, about a quarter of an inch thick; these are cut up into cakes and stored till dry enough for packing, and then forwarded to Calcutta for sale in the bazaars. The utilitarian value of lac dye over cochineal in a humid climate, especially in dyeing the scarlet cloth of the soldiers' coats, lies in its power to resist the action of human perspiration.

Shellac.—The manufacture of shellac is an entirely distinct process. The

*By J. Bosisto. From *Australasian Journ Pharm.*, February.

seed-lac at the bottom of the pan is removed, dried, and sifted. The finer dust, which is highly inflammable, is removed. The lac workers of India make it up into bracelets and ornaments of various kinds.

The coarse lac, which is to be made into shell, is put into long sausage-shaped bags of about two inches diameter, made of cloth like American drill. Under a shed is a charcoal fire, about two feet long and six inches wide; alongside of the fire-place is a bamboo pole, about three feet long and four inches diameter, filled with warm sand, inclining at a slight angle to the ground. On each side of the fire-place is sitting a man, or more generally a woman, each holding an end of the sausage-roll-looking bag about twelve inches high over the clear charcoal fire, turning the roll or bag briskly until the lac begins to ooze through the interstices of the cloth; the bag is still kept twisted until a coating of soft lac covers the outside. It is then removed from the fire, and a small disc of lac is placed here and there over the surface of the bamboo by a rapid turn of the wrist. A third woman is sitting at one end of the bamboo, holding in both hands a strip of aloe leaf, resembling very much a thin magic wand; this she pushes forward over the soft lac, repeating the motion three or four times, when a thin film of the lac covers over the round surface of the bamboo, which is immediately transferred into an open basket; the lac, drying rapidly, cracks up into many pieces—this is shellac.

Button-lac is simply shellac without spreading.

Sheet-lac is made in a similar manner to shellac, only the sheets are much thicker, and the woman removing it from the bamboo in a supple condition and with hands stretches it over the fire in order to remove the wave-like furrows which are impressed on it by the fibrous surface of the aloe-leaf. While doing this it is not uncommon to see the woman, who performs her work intelligently, lift the hot sheet to her mouth and bite out any foreign substance, such as dirt or sand, filling in the hole so made by a rapid movement of her hand over the sheet. The average rate of wages is an anna and a quarter (1⅞ of a penny) per day.

PESTLE AND MORTAR FOR HYPODERMIC SOLUTIONS.

JOHN WARD COUSINS, a London doctor, suggests a diminutive mortar for solution of tablets for hypodermic use, which is shown in the adjoining illustration. The two parts of unequal length have a tight-fitting joint, and the tablet with the proper quantity of water having been inserted with the little glass pestle, the whole is shaken. The solution is then to be emptied into the small end for facility in drawing it into a syringe. [It strikes us that there is a most remarkable degree of trouble and expense involved to accomplish what can be done just as well in a small glass vial. If the tablets furnished to British practitioners for hypodermic use are so intractable that they require contact with a pestle for their solution, we would suggest that they try some of those made in this country.—ED. AM. DRUG.]

Mines of Cinnabar Ore containing sixty-nine to eighty per cent of pure mercury have recently been discovered in the mining region of the Don, in Russia.

The New Cinchona Plantations in Guatemala.

FROM an interesting work on Guatemala, just published,* we take the following passages giving an account of the new enterprise of cinchona cultivation in this country.

During the residence of Dr. Stoll in Coban (altitude 4,357 ft.), the capital of the Department of Alta Verapaz, he visited the cinchona plantations started by Messrs. Sarg & Co., which had found such favor in the eyes of Government that they were distinguished by a premium. The following information was obtained by the author on the spot.

The first attempts at cultivation were made in 1877 with seeds of *Cinchona succirubra*, originally derived from the East Indies, and furnished by Kew Gardens. Of these seeds, 80 proved successful, but only 14 of the young trees finally survived. In 1879, seed of *Cinchona officinalis* was obtained directly from Ceylon, and this proved very prolific. The young plants were transferred during January and February of 1880 into open grounds, and prospered so well that they constituted the majority of the plantation at the time of Dr. Stoll's visit. They were then 12 feet high, and the stems 2 inches in diameter. Subsequently, experiments were made with *Cinchona Calisaya*, which were less successful; also with *Cinchona Ledgeriana*, of which about 100 trees survived.

The method of cultivation adopted by Sarg & Co. is as follows:

The seeds are propagated in boxes, and the young plants allowed to remain there until they are several inches high, that is, until they are 8 to 12 months old. They are then transferred directly into the open ground. On account of their tenderness, careful personal attention must be bestowed on them while in the shelter. After being transferred to the open air, they give but little further trouble. They are always planted in the coffee plantations, or *cafetales*, being set between the rows of coffee trees, in distances of 3½ varas (about 3½ yards). The lateral buds are usually cut off, so as to prevent the formation of scars.

After 8 years, bark may be collected. For this purpose, the bark is taken off the stem or trunk of the tree from the twigs down, and the whole tree then torn from the ground with its roots, which are also stripped. The bark is always preferably taken from the live trees, because it clings very tenaciously to the stem after the tree is dead.

Cinchona Ledgeriana does not succeed well in Coban, which is not situated high enough. The most advantageous is *Cinchona officinalis;* and for lower situations, *Cinchona succirubra.*

Dr. Stoll met a Mr. Forsyth, an Englishman, in the capital of Guatemala, who had arrived from Ceylon with the special object of travelling through the country and locating cinchona plantations at suitable places. He succeeded in obtaining the support of Government for this purpose, which dispatched him to Ceylon with 3,000 pesos, for the purpose of bringing over seeds and plants. From later information, the author learns that the object has been attained, not less than 1,553,000 seedlings having been planted (up to December, 1884) upon various sites of the western slope of the mountain chains. These are distributed among the following districts: in Finca, upon the plantation "El Porvenir" (belonging to President Barrios) 600,000; "El Tumbador," 294,000; in Chalhuitz, 118,000; in Costa-Cuca, 454,000; in Pueblo Nuevo, 82,000; and in Palmar, 5,000.

* *Guatemala. Reisen und Schilderungen aus den Jahren* 1878-1883. Von Otto Stoll, M.D., and Lecturer at the University of Zurich. (Illus.). 8vo, Leipzig, pp. 366 seq.

CORRESPONDENCE.

MENTHOL CONES.

The Editor of the American Druggist.

SIR:—To prevent any misconception as to the low price of menthol in Europe, I ask you to allow me to state that I attribute this almost entirely to the quality of the crystalline substance sold and used for cones. My reason for this statement is as follows:

The press in this country have agreed that the "dry white crystal" that is produced by manufacturers in Europe and also in Japan, when worked up into cones in England, does not produce the effect on the skin that the native-made China and Japan crystal did when we first introduced it and used it in a liquefied form and also in cones.

The oil from the Mentha arvensis that had all the crystalline matter extracted, having been sold as Japan oil of peppermint, has also damaged the reputation of this oil.

I was lately through some of the stores in Holland and there found the German form of cones; I was informed that the sale had entirely stopped, as the buyers complained that they could get no effect with them on the skin.

I asked a gentleman who was going to Germany to make inquiries there, and he learned that the chemists sold very few cones now, whereas previously they sold a large number to the students who now complain that they cannot get the effect on the skin and that it does not draw off the headache; it only produces an abrasion of the skin without giving any lasting effect.

They were asked to test the difference between the cones they had been using and those made here from menthol crystals imported by the American Trading Company and they found at once how great the difference was.

Menthol is one of the standard medicines and is most used by the natives of China, Japan, and India, and it has stood the test of time. It is no "new invention" "or advertised article that has its day."

There is this great difference, the natives go to the opposite extreme of the "*dry white re-crystallized camphor,*" for they prefer a semi-liquid form; even in cold weather if it has formed into crystals they liquefy it by heat.

The conclusion I draw is that as soon as the market is clear of the "faked up" menthol, and retail chemists understand the reason of the falling off of their sales, the public will return to this most efficacious and useful household remedy that has stood the test of hundreds of years in the East. Yours faithfully,

THOS. CHRISTY.

LONDON, May 4th, 1886.

Hopeine.

SIR:—Our attention has been directed to an article in your valuable medium on the subject of hopeine, and we should feel obliged if you would allow us to take exception to the statement that we were makers of hopeine, for if not contradicted at once, we should be placed in a false position both in America and Europe. Our connection with hopeine was inevitable, on account of the leading part we have always taken in the introduction and importation of new drugs and remedies; but not being ourselves manufacturers of any pharmaceutical preparations, we cannot hold ourselves responsible for their composition. When a new drug or preparation is brought on the market, we are at once called upon to supply it, and hopeine, so soon as it was advertised by the

sole manufacturers, The Concentrated Produce Co., Limited, of London and Brooklyn, who by a letter to us dated February 2d, 1886, take the entire responsibility of their statements and of the preparation known as hopeine, it was ordered from us.

Our position and action in this matter has been fully explained by us to our friends, Mr. F. Stearns, Detroit; Prof. Lloyd, of Cincinnati, etc., and we have received great assistance from Professors F. Spencer Baird and Asa Gray, in collecting such information as has enabled us to obtain through Mr. J. W. Colcord, of Lynn, a supply of American wild hops, to have the question of their yield of the alkaline hopeine clearly defined.

We remain, sir, yours truly,
THOS. CHRISTY & CO.

LONDON, June 1st, 1886.

[The above communication is accompanied by the following circular, which should be read in connection with it.—ED. AMER. DRUGGIST.]

10, Camomile street,
LONDON, E. C., Feb. 2d, 1886.

Messrs. Thos. Christy & Co., 155, Fenchurch Street, E. C.

DEAR SIRS:—In reply to your inquiry, we guarantee that the hopeine supplied to you on 8th Dec., 12th Dec., and 21st Dec., 1885, and 19th Jan., and 21st Jan., 1886, was similar in every respect to the article we supply to our other customers, including Messrs. Adrian & Co., of Paris; and that, as stated in our circulars, hopeine is prepared exclusively from hops.

We are, dear sirs, yours truly,
CONCENTRATED PRODUCE CO.,
W. WILD. SPRINGMUHL.

Antiseptic Powder.

Iodoform,
Powdered Cinchona,
Powdered Benzoin,
Powdered Carbonate of
Magnesium ..... equal parts.

Saturated with oil of eucalyptus.

Used as an application to wounds.—LUCAS-CHAMPIONNIÈRE, in *Bull. de la Soc. de Chir.*

Delacour's Lip Salve.—

Powdered Nut-galls,
" Pomegranate bark,
" Sumach..... āā ʒ i.
" Myrtle leaves,
Sulphate of Zinc.....āā ʒ ss.
Beeswax,
Spermaceti,
Oil of Sweet Almonds ..... āā ℥ i.
Tincture of Benzoin (dil.).... ʒ ij.
Mecca Balsam.....gtt. xij.
Ointment of Rose..... ʒ iv.
M.

Mercury and Urea for Hypodermic Use.

Urea..... .. ... 4 grains.
Corrosive Sublimate...15 "
Distilled Water..... 3 ounces.

Fifteen minims to be injected daily.—SCHULTZ, in *Deutsch. Med. Woch.*

The so-called **"Double-Chloride of Gold Cure"** for drunkenness is said to consist of

Chloride of Ammonium.....1 grain
Aloin. .....2 grains
Compound tinct. of Cinchona..3 ounces
Water, enough to make.....4 "

Paper of proper thickness is rendered transparent by soaking in copal varnish. When dry it is polished, rubbed with pumice stone, and a layer of soluble glass is applied and rubbed with salt. It is stated that the surface is as perfect as glass.

Danger from the Use of Nickel-Plated Cooking Utensils.—According to the Sanitary Counsel of Vienna, after a careful chemical examination of nickel and nickel-plated utensils, the use of such appliances are declared to be open to serious objection.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 1,730.—**Prescription Difficulty** (P. S.).

This correspondent writes as follows: "I wish to call your attention to the following prescription received by me some days ago:

℞ Morphin. Sulphat. .. .. 3 gr.
Acid. Tannic..... ..40 "
Acid. Carbol.....20 "
Butyri Cacao.....q. s.
Fiant suppositoria ix.

"Now it may seem strange if I say that these suppositories cannot be made. If the carbolic acid be added drop by drop, after all the other ingredients are mixed dry, and then a very gentle heat applied, a gummy, tenacious mass results, becoming very brittle and hard in a very short while. A carbolic acid in the crystallized form, and of 95%, and only the purest grades of the other ingredients were used, and like results as aforesaid obtained. By the most careful manipulation, and by trying four or five different ways, it was impossible to make a suppository satisfactory to the physician.

"Tannic acid is known to be precipitated from its solutions by certain acids. It being a glucoside, and yielding glucose by boiling with dilute acids, this conversion into glucose may take place more quickly when it is slightly heated with cacao butter and a *small* quantity of carbolic acid. I would like to have an explanation, how it is that tannic and carbolic acids when brought together, as in the above prescription, form so tenacious a mass; also whether my surmise as to the splitting up of the glucoside is in accordance with the facts?"

Regarding the last point, we would say that, in our opinion, there can be no splitting up of the tannic acid (beyond perhaps a minute trace), because all glucosides require for this purpose a certain amount (usually from 1 to 3 molecules) of water.

Now the only water that is likely to be present in the ingredients mentioned above is the minute quantity used for liquefying the carbolic acid, say 5%, which will make just about 1 drop, a small proportion existing as moisture in the tannic acid, and the very small quantity existing in the crystals of sulphate of morphine. But the latter will hardly come into play, as there is nothing present to decompose the morphine salt. The drop or minim of water present in the mixture is, however, utterly insufficient to convert more than a trace of tannin into glucose and gallic acid. This cannot be the explanation. Before trying another, let us try to make the suppositories *without heat*. From a previously prepared mixture of 9 parts of butter of cacao and 1 part of white wax, melted together and cooled, prepare fine shavings or raspings, weighing about 200 grains. Triturate about one-half of this, in a mortar, with the carbolic acid, which should have been liquefied by a gentle heat and not by the addition of water; in other words, it should be an acid which is crystalline at ordinary temperatures. Brisk trituration will soon render the mass homogeneous. Now gradually incorporate the tannic acid, keeping up the trituration, until a pale yellowish, perfectly smooth mass is produced. This may be much facilitated by transferring the mass to a marble slab and rubbing it out into a thin layer with the spatula; any little lumps will thereby be seen, and can be made to disappear.

Now mix a portion of the remaining butter of cacao with the morphine, and gradually incorporate the remainder of the butter of cacao. Finally add this portion to that previously prepared, and mix them thoroughly on the marble slab. Finally roll the mass out, cut it into the proper number of pieces, and shape each one by rolling with the spatula.

If our correspondent will try this method (even with plain cacao butter), he will find that it accomplishes the object.

Now as to our explanation. In the first place, it is necessary to avoid converting the sulphate of morphine into the tannate, before the salt is finely divided and diluted through the mass. The tannate of morphine is apt to form a sticky lump which it is difficult to divide afterwards. Then again, it is not advisable to warm the mass. Tannic acid is not soluble in oils, fats, and most liquids which dissolve oils. The cacao butter and carbolic acid are soluble in each other and perfectly miscible. But if the tannic acid is attempted to be distributed through the *melted* mass, it will agglutinate in lumps, which is facilitated by the minute proportion of moisture usually present in it. We consider the failure of our correspondent due to the bringing together antagonistic substances under circumstances permitting each to display its obstreperous character to the utmost.

No. 1,731.—**Testing the Purity of Raw and Boiled Linseed Oil.**

In reply to the query of our correspondent, we will give what we consider a sufficient array of proof.

A. Raw Linseed Oil:

1. Characteristic odor and taste. This cannot be described, but is familiar to any one who has handled the genuine oil.

2. Color golden-yellow, if cold pressed; darker, if hot pressed.

3. Spec. grav. 0.9385 at 10° C.; 0.9364 at 12° C.; 0.9350 at 15° C. (59° F.); 0.9325 at 20° C.; 0.930 at 25° C. (77° F.).

4. Congeals at −27° C. (−16.6° F.) to a firm, yellow mass. Begins to boil at 130° C. (266° F.).

5. Soluble in 1.5 parts of ether, 40 parts of cold 90% alcohol, 5 parts of boiling 90% alcohol, and 5 parts of cold absolute alcohol.

6. When linseed oil is mixed, in a test-tube, with an equal volume of nitric acid (sp. gr. 1.185) and a few pieces of copper foil or a little mercury is added, the oil should not become solid, or semi-solid on standing for several days (absence of non-drying oils), and the color of the oil should remain unaltered or nearly so (a yellowish-white, or pale-yellow color points to cod-liver oil, lard oil, etc., and a yellowish-brown to reddish-brown color to cotton-seed oil, dark qualities of cod-liver oil, and crude rape oil; a red to deep-red color points to sesame oil).

7. Spread a thin layer of the oil upon a flat surface of glass or porcelain, and expose it to the air. It should gradually dry up and form a tough, transparent skin within 2 or 3 days, which is no longer soluble in alcohol.

Other tests have been given, but many of them have no further merit than to indicate that the oil may be suspected; some of them are of doubtful utility. Certain manufacturers in Europe who have to purchase linseed oil, often rely on the lead test, which is performed by boiling a portion of the crude oil with white lead, when the latter should not become blackened. The test is quite proper if it is intended to prove the presence of sulphur, but while this may be due to the oil being adulterated with rapeseed oil (which usually contains sulphur compounds), it may also be due

of the fact that the oil was extracted trom the seed by means of bisulphide of carbon, which often holds a little sulphur in solution.

B. Boiled Linseed Oil.

When linseed oil is boiled for some time by itself, a portion of the linolein (the linoleate of glyceryl) is converted into the anhydride of linoleic acid, and the corresponding quantity of glyceryl is converted into glycerin which separates. The anhydride which is formed dissolves in the remainder of the linseed oil.

It has been proposed to show the presence of crude or *unboiled oil*, in boiled linseed oil, by some method of estimating the glycerin, which is best done by saponifying the oil, decomposing the soap, treating the aqueous solution, which must contain the glycerin, with permanganate, which changes the glycerin to oxalic acid, and estimating the latter as calcium oxalate.

This method is unobjectionable, but it goes too far, because the whole of the glycerin is not removed from every boiled oil. It might be rendered of practical use, if a limit could be decided on, beyond which the amount of glycerin should not extend.

A large proportion of boiled linseed oil is prepared with the intervention of oxide of lead; hence this is liable to be present, and must not be regarded as an impurity.

Borate of manganese is also often used to prepare a rapidly-drying linseed oil. Not unfrequently this substance is added to unboiled oil, or a mixture of boiled and raw oil, and the product sold as "boiled oil." When borate of manganese has been found in the oil by analysis, it will be advisable to estimate the amount of glycerin the oil is capable to yield, in order to obtain an approximate idea as to the proportion of raw oil originally present.

Both the raw and the boiled linseed oil are frequently adulterated with rosin oil. This may be detected by mixing a sample of the oil with concentrated sulphuric acid (sp. gr. 1.845). which will produce a dark-brown clot with the raw oil if pure; but if rosin oil was present, a reddish-brown spot will quickly form, which retains its tint for a long time, with a peculiar scum formed over it. In boiled oil, the detection of rosin oil is difficult and often impossible.

The best practical test, after all, that can be applied to boiled linseed oil is the rate at which it dries. For, in the end, it matters but little whether it is pure linseed oil or not, if it will only dry up rapidly to a tough skin. A thin layer of it spread upon glass should dry up, within twenty-four hours, to a skin which, though perhaps still soft, cannot be wiped off, and should be entirely hard after another twenty-four hours.

No. 1,732.—**Ammoniacal Solution of Oxide of Copper** (W. A., N. Y.)

One of our readers who had read the original of the note on indestructible paste for closing letters (see elsewhere in this number), asks us how the solution of oxide of copper in ammonia is to be made. He tried to dissolve cupric oxide in ammonia, but failed to obtain a liquid which would dissolve cellulose or cotton.

Cupric oxide is not soluble in water of ammonia, unless a few drops of acid or some other ammonium salt (as the carbonate) is present. In this case, a deep-blue liquid will result, which contains a basic salt of copper. This is, however, not the liquid wanted; at least it has only feeble solvent power upon cellulose.

The solvent for cellulose may be obtained in various ways:

1. Introduce metallic copper into a capacious vessel, and pour upon it enough water of ammonia to partly cover it. Open the vessel from time to time, to give free access of air. The ammoniacal liquid will gradually assume a blue color, and contain in solution cupric oxide.

2. Place copper turnings, or copper wire, or copper clippings, into a long narrow glass percolator, or into the broken-off neck of a retort, or into a long glass adapter, and pour upon it strong solution of ammonia. The neck of the apparatus may be closed with a rubber cork, containing a glass tube provided with a piece of rubber tube and pinch-cock, or with a stop-cock. Let the liquid run through gradually, and then pour it back again. Repeat this, until a deep-blue solution results. The addition of a few drops of solution of chloride of ammonium hastens the process.

3. Precipitate sulphate of copper with sodium carbonate. Dissolve the resulting basic carbonate of copper in concentrated water of ammonia.

The resulting solution is capable of dissolving cellulose at ordinary temperature. Cotton is dissolved within about half an hour; silk within about twenty-four hours. Upon wool it exerts no solvent action whatever. For this reason the solution is often used as a test for fabrics.

The solution of cellulose may even be filtered, after it has been sufficiently diluted with water. On adding an acid or a salt to the solution, however, the cellulose (disorganized) is precipitated again.

No. 1,733.—**Mercurial Ointment** (E. P. S., M.D., Kansas).

The following communication, received by the publisher of the Pharmacopœia, has been handed to us for a reply:

"Will you, through the proper person, get for me the correct formula for Unguentum Hydrargyri, or Mercurial ointment, see 6th Ed. U. S. P., p. 367, the last ingredient given in the article we are supposed to be making, of which we take 100 parts to make 1,000 parts of itself. This is, of course, an error, and it is what we want corrected, for I do not believe in homœopathic dilutions being stronger than the parent article."

This is a fair specimen of much of the criticism made of the text of the Pharmacopœia, by persons who will not take the trouble to inform themselves concerning matters of which they are ignorant or in doubt, before expressing an opinion. If the writer of the above will take the trouble of reading the formula and directions *carefully*, and will then read the article on mercurial ointment in the recent editions of either of the dispensatories, he will probably reach a different conclusion.

We may here remark that we have been often impressed with the number of people who go through life with their eyes shut, so to say, and who stumble over opportunities for acquiring information, without stopping for even a few moments to find out what the true nature is of the thing with which they have come into contact. They behave, under such circumstances, much like a skittish horse which sees an unfamiliar object in the road, and without stopping to learn what it is, shy at once, and run away from it. The result is usually quite similar to that which accompanies the above correspondence. They make trouble for others, and injure their reputation for intelligence.

No. 1,734.—**Corn Remedy** (Delta).

We are asked to furnish a formula for an effective corn cure, made with vaseline as a constituent, or any ointment that will do its work effectually and speedily.

We do not think that an effective corn application can be made with vaseline, because this remains too soft, or will liquefy by the heat of the body, particularly when the foot is encased in a shoe. The best kind of application will be one which remains for some time in contact with the corn. Among those which have been reported as really efficacious are the following:

1. *Gezow's* Corn Cure.* (See NEW REM., 1882, 85.)

Extr. Cannabis Indica	10 gr.
Salicylic Acid	50 gr.
Collodion	1 fl. oz.

(Quantities slightly altered).

Mix and dissolve. It is applied by means of a camel's-hair pencil, so as to form a thick coating, for four consecutive nights and mornings. The collodion at once covers and protects the corn from friction. The Indian hemp acts as an anodyne, and the acid disintegrates the corn, so that after a hot bath on the fifth day, it will usually come out, adhering to the artificial skin of collodion.

2. Another similar preparation, also suggested by a Russian apothecary, is the following:

Turpentine	30 gr.
Salicylic Acid	45 gr.
Collodion	1 fl. oz.

3. *Baudot's Corn Plaster.*

Resin Cerate	600 gr.
Galbanum Plaster	600 gr.
Subacetate Copper	230 gr.
Turpentine	75 gr.
Creasote	45 gr.

Mix and make a plaster.

There are a number of proprietary corn plasters which contain nearly the same ingredients as the preceding, merely ringing the changes.

4. *Laroche's Corn Plasters.*

Olive Oil	30 parts.
Yellow Wax	10 "
Wheat Flour	90 "
Acetic Acid	60 "
Boracic Acid	30 "
Oil Lavender	3 "
Vinegar	30 "

Mix. Apply to the corn for 24 hours. This is a proprietary preparation, which has the above formula, according to Hager.

5. *Vomacka's Corn Remedy* was published in our April number, page 80.

No. 1,735.—**Saccharin** (Several Inquirers).

We have already, on several occasions, noticed this substance, which must not be confounded with the chemical individual heretofore known as *saccharin* (the anhydride of saccharic acid, $C_6H_{10}O_5$). It is rather unfortunate that the discoverers chose the name saccharin, and thereby caused confusion among chemical terms. If they desired to adopt a popular name expressing the idea of *sweetness*, some derivative of the Latin *dulcis*, or the Greek $\gamma\lambda\upsilon\kappa\upsilon\varsigma$ might have been chosen. Though we have already several such derivatives applied to chemical individuals, namely, dulcite (also called dulcin, dulcose, etc.) and glycin (also called glycocoll), it would not have been very difficult to ring the changes on these terms. Hager states that he shall apply the term "saccharinin" to the substance.

The saccharin recently discovered is a derivative of the benzol-series, and is properly the anhydro-ortho-sulphamine-benzoic acid, or the sulphimide of benzoic acid, or benzoyl-sulphonic-imide, and its constitution is expressed by the symbols

$$C_6H_4\left\{\begin{matrix}C & O\\ S & O\end{matrix}\right\}NH$$

The substance was discovered by Constantine Fahlberg, of New York. The starting-point is toluol—$C_6H_5CH_3$—a constituent of coal-tar. This is first treated with concentrated sulphuric acid at a temperature not ex-

* Remington, in his *Practice*, page 1,024, calls this Liebig's Corn Cure, evidently by a *lapsus pennæ*.

ceeding 212° F., and is thereby converted into two toluol-sulphonic acids $C_6H_4.CH_3.SO_3$, which are first combined with calcium and are then converted into the sodium salt. The latter is mixed, when dry, with phosphorus trichloride, and a current of chlorine passed over the mixture, under constant stirring. When the reaction is completed, the oxychloride of phosphorus produced thereby is distilled off, and the mixture of remaining toluol-sulphonic-chloride ($C_6H_4.CH_3.SO_2Cl$) strongly cooled. This causes the separation of crystals of the *para* compound, while the *ortho* compound remains liquid, and is separated by a centrifugal machine. The latter is now treated with dry ammonia or mixed with carbonate of ammonium, and thereby converted into ortho-toluol-sulphimide ($C_6H_4.CH_3.SO_2NH_2$), which is difficultly soluble in water, and is freed from chloride of ammonium by washing with water. Finally, the *ortho* compound last obtained is oxidized by being introduced into a dilute solution of permanganate, care being taken that any free alkali or alkaline carbonate produced is neutralized by the cautious addition of an acid. The resulting product is then the potassium salt of the product desired, which remains in solution. The latter having been separated from the manganic hydrate, it is treated with an acid which causes the separation of crystalline benzoic sulphimide or "saccharin":

$$C_6H_4 \begin{Bmatrix} CO \\ SO \end{Bmatrix} NH$$

The chemical properties of this substance require careful study, as it is quite likely that it will be much used for artificially sweetening articles of consumption or medicines.

No. 1,736.—**Cinchonamine** [and **Eurhodine**] (Qu.).

Our correspondent asks where he may obtain the alkaloid cinchonamine, or salts of it, as he wants to try it as a precipitant for nitric acid, for which purpose it has been highly recommended, as it forms a nearly insoluble compound with it.

We have been looking for some of this substance ourselves, but, beyond a small sample furnished to us by a private party, we have not heard of any being for sale here at present. We have sent to Europe for some, and in a short time it will be obtainable, we believe, from dealers in chemicals and reagents.

In connection with the above, it will be of interest to state that a still more *insoluble nitrate* has recently been found by Dr. Otto N. Witt (*Journ. Chem. Soc.*, 1886, 391 sqq.). This chemist has discovered a new series of coal-tar colors of very remarkable properties, among which their exceeding stability and feeble solubility are most noticeable. The new base has been named by him *eurhodine*, and the nitrate of this is absolutely insoluble in water, even when boiling. All its salts are, however, partly decomposed by water, except when an excess of acid is present, when they are quite stable. Whether this substance will be available for the purpose of estimating nitric acid will have to be decided by a further examination.

No. 1,737.—**Method of Clarifying Cider, Ale, Beer, and Similar Liquids.**

This correspondent wants to know what substances are used in the most renowned breweries for clarifying the product, and which may also be used for clarifying cider.

In reply we have to say, that a great many substances have been used, or recommended to be used for this purpose, and it is impossible for us to say which of them are employed in any given brewery of this country, since the latter have been, up to the present time, outside of the control or supervision of the State or Government authorities, except in the matter of internal revenue duties.

But we are enabled to give information regarding the substances permitted by law to be used in Bavaria, the country which is renowned for the best and purest malted liquors. The government supervision over the entire process of brewing is there so strict that infringements of the law have become very scarce, as they are punished by very heavy fines.

The only clarifying agents permitted to be used there are *mechanical ones*, that is, such as will not enter into solution or remain in the liquid under any circumstances. The principal ones are *isinglass* and fine *wood shavings*. Clarifying by means of isinglass is so well known that it need not be described here. The second method, however, is not so well known, and, as it is quite effective, a brief description of it will be of use to many of our readers.

Any kind of moderately close-fibred wood, which is free from strongly tasting resinous matters, may be used for this purpose, but the most suitable has been found to be beach-wood, and hazel-wood. Either of these is cut into lengths of 6 to 12 inches, the bark carefully removed, and the wood reduced, by a machine, to shavings, which ought to be as thin as possible. These must be deprived of tannin by being soaked for several days in cold water, and afterwards repeatedly boiled with water until the latter no longer acquires any color. Only a comparatively small portion of these purified shavings need be used for a cask of the liquid to be clarified—about ½ pound for 15 gallons. The modus operandi by which the clarifying is accomplished is, of course, a purely mechanical one, mostly due to currents established by capillary attraction into the fibres of the wood floating on top of the liquid, and the mechanical adherence of suspended impurities to the surface of the shavings, as a new portion of the turbid liquid is brought towards the surface.

When the casks are emptied the shavings may be taken out, washed, and used over again. The wood shavings are a regular article of trade, and may be obtained through dealers in brewers' supplies.

No. 1,738.—**Removal of India-ink Tattooing** (Subscriber).

We have given a brief answer to this query, put by another correspondent, in our last issue. We will answer it once more.

If our correspondent will remember what the nature of the black ingredient in India ink is, he will realize the difficulty of the operation better. It is simply *carbon* in an exceedingly fine state of division. There is a popular notion among sailors that the best material for black tattooing is gun-powder, which is said to produce the least irritation when rubbed into the punctured skin. Of course, here it is likewise the carbon or charcoal which is deposited in the finely punctured wounds.

As there is no solvent for carbon, and it is indestructible except by combustion, there is no other method of getting rid of it, when deposited in the skin, than to remove it in substance. This can sometimes be done by causing a superficial suppuration through the application of certain vesicating or caustic substances. But this is an unsafe method in the hands of the inexperienced. It should never be done, except under the advice and treatment of a competent physician. The cautious application of the galvano-cautery may also be found efficacious in certain cases.

No. 1,739.—**Muriate of Tin** (G. W. H.).

This subscriber asks, "How much crystals of muriate of tin does it take to make solution of muriate of tin for dyeing red with cochineal?"

The mordaunting or fixing liquids used for fastening carmine upon fabrics is varied considerably in strength, 1 part of metallic tin being contained in from 5 to 16 parts of the liquid. Probably 1 in 10 is the most common proportion. To prepare such a solution from the commercial crystals of the (pentahydrate of stannic chloride, or) oxymuriate of tin, $SnCl_4.5H_2O$, which contains 117.8 parts of tin in in 349.4 parts, *three* parts of this salt must be dissolved in sufficient water to produce *ten* parts of solution.

No. 1,740.—**Tooth Cement** (Dr. L.).

"Dentists use for temporary filling a compound known as 'oxyphosphate of zinc,' and another called 'oxychloride of zinc.' Of these, there are two parcels in small bottles—one a powder and the other a liquid, which, when mixed in certain proportions, form a paste, becoming hard in a longer or shorter time. What are the ingredients, and why do some samples 'set' more rapidly than others?"

The oxychloride of zinc paste is prepared as follows: Mix 1 part of impalpable powder of glass (obtained by elutriation) with 3 parts of finely-powdered oxide of zinc, which had previously been deprived of all carbonic acid gas by ignition. Next dissolve 1 part of borax in the smallest possible quantity of hot water, and add it to 50 parts (all by weight) of a solution of chloride of zinc having a sp. gr. of 1.5 to 1.6. Keep the mixed powders and the solutions in separate vials. For use, a portion of the powder is mixed with enough of the solution to make a uniform paste, and the latter at once applied. It will set very rapidly, and it is the function of the borax to retard this a little. By adding a suitable proportion of ochre, the mass may be more or less tinted. When it is set it is as hard as marble, and has, in fact, been recommended as a material for making statuary. It is often called Paris tooth cement.

If any commercial samples do not set as rapidly as others, the fault may lie either with the powder or the solution, the former containing, perhaps, some carbonate, and the latter too much borax or too much water.

The "oxyphosphate of zinc" paste is no doubt a similar preparation, but we do not know the precise method of preparing it. Perhaps some of our readers can furnish it. The "diamond tooth cement" is made by rapidly mixing anhydrous phosphoric acid with lime and filling the tooth with this paste, which soon sets into hard phosphate of calcium.

No. 1,741.—**Dentists' Alloy or Amalgam** (Dr. L.).

"Why do some of these alloys turn black in the mouth, while others do not?"

The alloys, or, rather, amalgams used by dentists are of varying composition. The best is made by adding mercury to pure gold (in a heated iron capsule or ladle) until the mass is of a doughy consistence at the temperature of hot water. Other alloys (amalgams) are made of silver and mercury; in others, again, the silver is replaced by zinc, tin, cadmium, bismuth, etc. Next to the gold alloy, the best is one containing gold, platinum, and mercury, and next may be placed the copper alloy. All those which contain metals, rendered black by sulphur or or sulphides, are liable to turn dark. The mercury need not be regarded in this reaction, since it gradually disappears from the surface of the "filling." The gold-platinum amalgam will, of course, preserve its color best.

No. 1,742. — **Dyeing Wood Black** (M. C.).

We are requested to indicate a method by which a clarionet made of cocoa wood, that has once been dyed black, may be dyed over again. In reply, we would say that if the article were one which would stand immersion into a boiling liquid, we might recommend several methods by which this may be accomplished. But we are not sure whether the clarionet would stand it. However, we will quote a process that has been stated to work well.

Boil 4 oz. of logwood and 1 oz. of coarsely powdered nut-galls with ½ gallon of water, strain, and add 1½ oz. of sulphate of copper. Introduce the wood into this solution, and leave it for twenty-four hours. Then take it out, dry it, and immerse it into a solution of acetate of iron (spec. gr. 1.030). By repeated immersion in the two liquids, the color may be deepened.

The black color thus produced may be rendered fast and very intense by applying to it a varnish prepared in the following manner:

Triturate 60 grains of aniline black with a mixture of 1 fluidounce of alcohol and 60 drops of concentrated hydrochloric acid. Dilute the deep-blue solution thus obtained with a solution of about 90 grains of shellac in 4½ fluidounces of alcohol, and apply it to the wood, rubbing it well in.

Note.—Aniline black can properly be produced as a permanent dye only in the fabric itself. The aniline black sold in the trade is insoluble in ordinary solvents, and when dissolved by means of an acid does not exhibit a black color. This will, however, make its appearance after some time, if the surface to which it has been applied is suitably prepared.

No. 1,743.—**Curd Soap** (G. and C.).

The curd soap mentioned in our May issue as an ingredient in shaving cream is intended to mean any kind of good white soap, made with soda and some *animal* fat, such as tallow. It does *not* mean soft soap. We presume that Castile soap (made from soda and *vegetable* fats) will answer the same purpose, while it is probably nicer and cleaner.

No. 1,744.—**Lanolin** (G. & C.).

This new base for ointments may be obtained from any wholesale drughouse at between $1.00 and $1.20 per pound.

Formulæ Wanted.

1. *Liebig Company's Coca Beef Tonic.*—[It is astonishing what abuse is being carried on with some names. Liebig's name is being pirated all over the world in the most unblushing manner. It is well known that the only manufacturing enterprise he ever was personally interested in, was the preparation of extract of Beef in Fray Bentos in South America. While he lived, no serious attempt was made by others to utilize his name for advertising purposes. At present there are dozens of proprietary articles which are ornamented, in some way or other, by the name of this chemist.]

2. *Foster's Bone Liniment.*

3. *Polyform* (Edison's).—We have been told that the following produces a preparation very much resembling it:

Chloral	1 oz.
Camphor	4 oz.
Morphine Sulph	3 gr.
Chloroform	1 fl. oz.
Ether	4 fl. oz.
Alcohol	6 fl. oz.
Oil of Peppermint	60 ♏

4. Composition of "*Tasteless Castor Oil*" (proprietary ?).

5. *Pettit's Eye Salve.*

6. *Moxie Extract Nerve Food.*

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THE VEGETABLE MATERIA MEDICA OF WESTERN INDIA. By W. DYMOCK, Surgeon Major, Bombay Army, etc. Second edition, revised and enlarged. Bombay and London: 8vo, 1886, pp. vi., 1,012.

THE first and second parts of the new edition of this important work has been noticed by us in our January number, and the publication has been pushed forward so rapidly that the whole work lies now completed before us. It has gained considerably in extent by the introduction of the results of extended new researches by the author, and the careful gleaning from the literature both of Europe and the East, of everything that is calculated to shed light upon the subjects treated of. It is impossible to do justice to the work by brief abstracts, and therefore we refer in advance to future numbers of our journal, as we shall often have occasion to refer to it.

In appendix *A*, the author gives a list of undetermined drugs; next follows appendix *B*, treating of oriental weights; *C*, containing a list of wild plants and seeds used as food during the Deccan famine of 1877–78.

Appendix *D* contains a report on the chemical composition of the Indian species of Coca, namely *Erythroxylon monogynum* vel *Indicum*, by L. A. Waddell, M.B., Prof. of Chemistry, Calcutta Med. Coll. He states that he has been unable to find any alkaloid, or any other crystalline or amorphous salts in the leaves of this plant.

Appendix *E* gives an extensive list of Marathî names and drugs, which will be of considerable service to orientalists. A detailed index completes the treatise, which is one of the standard and indispensable works of reference.

DR. F. BEILSTEIN'S LESSONS IN QUALITATIVE CHEMICAL ANALYSIS. Arranged on the Basis of the Fifth German Edition. With Copious Additions, including Chapters on Chemical Manipulations, Analysis of Organic Substances, and Lessons in Volumetric Analysis. By CHAS. O. CURTMAN, M.D., Professor of Chemistry in the Missouri Medical College and the St. Louis College of Pharmacy. Second Edition, revised and enlarged, with additional chapter on Analysis of Drinking Water and of Urine. 8vo. St. Louis, 1886 (Druggist Publishing Co.), pp. xii., 200.

PROF. CURTMAN'S adaptation of Beilstein's Qualitative Analysis to the scope and requirements of chemical instruction in medical and pharmaceutical schools has been eminently successful, because it is based on the most natural plan yet devised, namely, to make the student thoroughly acquainted with the properties, behavior, and reactions of the most important *typical* individual chemical compound or element representing the different groups, before an attempt is made to teach him the method of separating the constituents of a compound or mixture, or recognizing them as individuals, by a systematic course of analysis.

The second half of the work is entirely written by Prof. Curtman. It contains examples for practice in analysis of organic substances, a detailed exposition of volumetric analysis, followed by chapters on the analysis of water and urine.

The work may, in our opinion, also be used with advantage for self-study.

THE INTERNATIONAL ENCYCLOPÆDIA OF SURGERY: A Systematic Treatise on the Theory and Practice of Surgery by Authors of Various Nations. Edited by JOHN ASHHURST, Jr., M.D., Professor of Clinical Surgery in the University of Pennsylvania. Illustrated with chromo-lithographs and woodcuts. In six volumes. Vol. VI. New York: Wm. Wood & Co., 1886, pp. 1,272.

THE concluding volume of this great work comprises the following subjects: Injuries and Diseases of the Œsophagus, by J. Solis Cohen; Intestinal Obstruction, by J. Ashhurst, Jr.; Injuries and Diseases of the Rectum, by Wm. Allingham; Urinary Calculus, by E. L. Keyes; Lithotrity, by W. H. Hingston; Injuries and Diseases of the Bladder and Prostate, by R. Harrison; Injuries and Diseases of the Urethra, by S. Duplay; Injuries and Diseases of the Male Genital Organs, by H. R. Bell; Injuries and Diseases of the Female Genitals, by T. Parvin; The Cæsarean Section and its Substitutes; Laparotomy for Ruptured Uterus and for Extrauterine Fœtation, by R. P. Harris; Ovarian and Uterine Tumors, by C. C. Lee; Inflammatory Affections of the Bones, by L. Ollier; Scrofulo-Tuberculosis and other Structural Diseases of Bones, by E. Vincent; Tumors of the Bones, by A. Poncet; Orthopædic Surgery and the Treatment of Deformities, by F. R. Fisher; Construction and Organization of Hospitals, by E. Cowles; Preparation of Military Surgeons for Field Duties; Apparatus Required; Ambulances; Duties in the Field, by B. A. Clements, and a History of Surgery, by G. Y. Fisher.

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